

For KS & ASME



## BUTT-WELDING FITTINGS



(주)엠에스밴드



# BUTT WELDING FITTING

We have excellent competitive power in the pipe fitting, the most important in the piping after pipes. We have produced/supplied Butt-weld Fitting and Flange for a long time through our self-production facilities. Especially, Big size, Heavy Wall Fitting has satisfied customers' various needs with whole-size and whole-material supply system through cooperation with foreign companies.

## ASME(B 16.9 / B 16.28 / MSS SP-95)

Elbow(90°LR/SR, 45°LR/SR)

Tee(Straight, Reducing)

Reducer(Concentric, Eccentric)

Cap, Stub Ends, Swage Nipple

A234-WPB / WPC / WP91 / WP11 / WP22

A420-WPL3 / WPL6

A403-WP304(L)WP316(L) / WP321(H) / WP347(H)

B366-WPN / WPNL / WPNC / WPNCI / WPNCNC

WP20CB / WPNC / WPNC10 / WPNCMC



## JIS(JIS B2311 / 2312 / 2313, KS B1522 / 1541 / 1543)

Elbow(90°LR/SR, 45°LR/SR)

Tee(Straight, Reducing)

Reducer(Concentric, Eccentric)

Cap



# PIPE

Seamless and Weld Pipe are the most important and the most basic materials in the plant piping system. We are increasing our competitive power in supplying Alloy, Nickel alloy and Duplex Pipe as well as Carbon and Stainless, keeping pace with rapidly changing plant environment.

Especially, we are preparing for upcoming nuclear power market, equipped with self-production facilities for Stainless EFW Pipe by ASME III.

## **ASME(The American Society of Mechanical Engineers)**

**Carbon Steel Pipe(Seamless & Welded)**

A53 / A106 / A672

**Austenitic Stainless Steel Pipe(Seamless & Welded)**

A312 / A358 / A409

**Supper Stainless Steel Pipe**

904L / 254 / Alloy 20

**Ferritic-Austenitic Stainless Steel Pipe(Seamless & Welded)**

Duplex(2205 / S31803) / Super Duplex(2507 / S32750)

**Nickel Alloy Steel Pipe**

800H / 800HT / Alloy20 / Nickel200 / Nickel201 / Monel400

**Exotic Alloy Steel Pipe**

C276 / C22 / B2 / B3 / Alloy 600 / Alloy601 / Alloy625 / Alloy825



## **JIS(Japanese Industrial Standards)**

**KS(Korean Industrial Standards)**

**Carbon Steel Pipe(Seamless & Welded)**

SGP(SPP) / STPG(SPPS) / STPT(SPHT)

**Austenitic Stainless Steel Pipe(Seamless & Welded)**

SUS(STS)304TP / SUS(STS)304LTP / SUS(STS)316TP / SUS(STS)316LTP



# CERTIFICATE

MSBAND has been trying to get all related certificate be as best qualified partner to supply piping component, with management ideology of the Best technology, Deep impression by customers and Overwhelming the world market as a oil pressure piping material maker. We are making only high quality products with the best usability, the most suitable and best performance, which is proved by various certificate at home and abroad. MSBAND Is making more effort to be born again as the best company leading the world market.

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KS & ASME

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## ASME

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# STEEL & STAINLESS STEEL **KS / JIS** BUTT-WELDING PIPE FITTINGS



■ KS / JIS

# STEEL BUTT-WELDING PIPE FITTINGS

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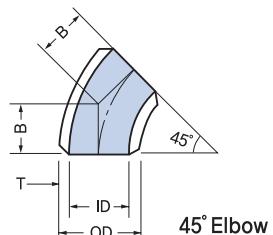
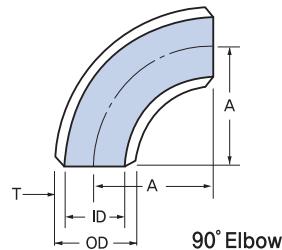
# STEEL BUTT-WELDING PIPE FITTINGS

KS | JIS

- **90° Elbow (Long, Short)**

- **45° Elbow (Long)**

SPP/SGP, 7.9, STD, X-S



KS B 1522, JIS B 2311

Unit : mm

Nominal Pipe Size	Outside Diameter OD	Inside Diameter ID	Wall Thickness T	Long		Short
				90°	45°	90°
				A	B	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
550	558.8	543.0	7.9	838.2	347.2	558.8
600	609.6	593.8	7.9	914.4	378.7	609.6
650	660.4	644.6	7.9	990.6	410.3	660.4
700	711.2	695.4	7.9	1066.8	441.9	711.2
750	762.0	746.2	7.9	1143.0	473.4	762.0
800	812.8	797.0	7.9	1219.2	505.0	812.8
850	863.6	847.8	7.9	1295.4	536.6	863.6
900	914.4	898.6	7.9	1371.6	568.1	914.4
950	965.2	949.4	7.9	1447.8	599.7	965.2
1000	1016.0	1000.2	7.9	1524.0	631.2	1016.0
1050	1066.8	1051.0	7.9	1600.2	662.8	1066.8
1100	1117.6	1101.8	7.9	1676.4	694.4	1117.6
1150	1168.4	1152.6	7.9	1752.6	725.9	1168.4
1200	1219.2	1203.4	7.9	1828.8	757.5	1219.2

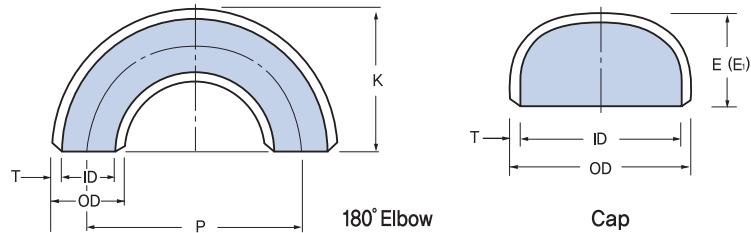
KS B 1543, JIS B 2311/3

Unit : mm

Nominal Pipe Size	Outside Diameter OD	Wall Thickness T						Center to Center		
		7.9T		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

**• 180° Elbow (Long, Short)**
**• Cap**

SPP/SGP



KS B 1522, JIS B 2311

Unit : mm

Nominal Pipe Size	Outside Diameter OD	Inside Diameter ID	Wall Thickness T	CAP	180° Elbow				
					E	Long		Short 90°	
						P	K	P	K
15	21.7	16.1	2.8	-	76.2	49.0	-	-	-
20	27.2	21.6	2.8	-	76.2	51.7	-	-	-
25	34.0	27.6	3.2	38.1	76.2	55.1	50.8	42.4	
32	42.7	35.7	3.5	38.1	95.2	69.0	63.6	53.2	
40	48.6	41.6	3.5	38.1	114.4	81.5	76.2	62.4	
50	60.5	52.9	3.8	38.1	152.4	106.5	101.6	81.1	
65	76.3	67.9	4.2	38.1	190.6	133.5	127.0	101.7	
80	89.1	80.7	4.2	50.8	228.6	158.9	152.4	120.8	
90	101.6	93.2	4.2	63.5	266.8	184.2	177.8	139.7	
100	114.3	105.3	4.5	63.5	304.8	209.6	203.2	158.8	
125	139.8	130.8	4.5	76.2	381.0	260.4	254.0	196.9	
150	165.2	155.2	5.0	88.9	457.2	311.2	304.8	235.0	
200	216.3	204.7	5.8	101.6	609.6	413.0	406.4	311.4	
250	267.4	254.2	6.6	127.0	762.0	514.7	508.0	387.7	
300	318.5	304.7	6.9	152.4	914.4	616.5	609.6	464.1	
350	355.6	339.8	7.9	165.1	1066.8	711.2	711.2	533.4	
400	406.4	390.6	7.9	177.8	1219.2	812.8	812.8	609.6	
450	457.2	441.4	7.9	203.2	-	-	-	-	
500	508.0	492.2	7.9	228.6	-	-	-	-	

# STEEL BUTT-WELDING PIPE FITTINGS

KS | JIS

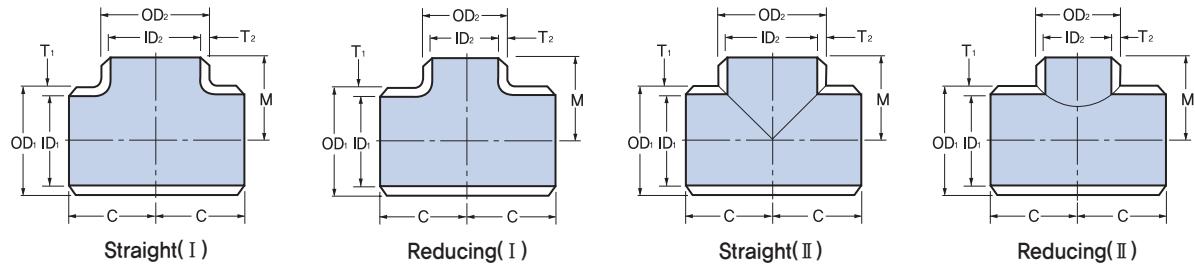
## • Tee

SPP/SGP

KS B 1522, JIS B 2311

Unit : mm

Nominal Pipe Size	Run			Outlet			Center to End	
	Outside Dia. OD <sub>1</sub>	Inside Dia. ID <sub>1</sub>	Wall Thick. T <sub>1</sub>	Outside Dia. OD <sub>2</sub>	Inside Dia. ID <sub>2</sub>	Wall Thick. T <sub>2</sub>	C	M
15	21.7	16.1	2.8	21.7	16.1	2.8	25.4	25.4
20	27.2	21.6	2.8	27.2	21.6	2.8	28.6	28.6
20 × 20 × 15	27.2	21.6	2.8	21.7	16.1	2.8	28.6	28.6
25	34.0	27.6	3.2	34.0	27.6	3.2	38.1	38.1
25 × 25 × 20	34.0	27.6	3.2	27.2	21.6	2.8	38.1	38.1
25 × 25 × 15	34.0	27.6	3.2	21.7	16.1	2.8	38.1	38.1
32	42.7	35.7	3.5	42.7	35.7	3.5	47.6	47.6
32 × 32 × 25	42.7	35.7	3.5	34.0	27.6	3.2	47.6	47.6
32 × 32 × 20	42.7	35.7	3.5	27.2	21.6	2.8	47.6	47.6
32 × 32 × 15	42.7	35.7	3.5	21.7	16.1	2.8	47.6	47.6
40	48.6	41.6	3.5	48.6	41.6	3.5	57.2	57.2
40 × 40 × 32	48.6	41.6	3.5	42.7	35.7	3.5	57.2	57.2
40 × 40 × 25	48.6	41.6	3.5	34.0	27.6	3.2	57.2	57.2
40 × 40 × 20	48.6	41.6	3.5	27.2	21.6	2.8	57.2	57.2
40 × 40 × 15	48.6	41.6	3.5	21.7	16.1	2.8	57.2	57.2
50	60.5	52.9	3.8	60.5	52.9	3.8	63.5	63.5
50 × 50 × 40	60.5	52.9	3.8	48.6	41.6	3.5	63.5	60.3
50 × 50 × 32	60.5	52.9	3.8	42.7	35.7	3.5	63.5	57.2
50 × 50 × 25	60.5	52.9	3.8	34.0	27.6	3.2	63.5	50.8
50 × 50 × 20	60.5	52.9	3.8	27.2	21.6	2.8	63.5	44.5
65	76.3	67.9	4.2	76.3	67.9	4.2	76.2	76.2
65 × 65 × 50	76.3	67.9	4.2	60.5	52.9	3.8	76.2	69.9
65 × 65 × 40	76.3	67.9	4.2	48.6	41.6	3.5	76.2	66.7
65 × 65 × 32	76.3	67.9	4.2	42.7	35.7	3.5	76.2	63.5
65 × 65 × 25	76.3	67.9	4.2	34.0	27.6	3.2	76.2	57.2
80	89.1	80.7	4.2	89.1	80.7	4.2	85.7	85.7
80 × 80 × 65	89.1	80.7	4.2	76.3	67.9	4.2	85.7	82.6
80 × 80 × 50	89.1	80.7	4.2	60.5	52.9	3.8	85.7	76.2
80 × 80 × 40	89.1	80.7	4.2	48.6	41.6	3.5	85.7	73.0
80 × 80 × 32	89.1	80.7	4.2	42.7	35.7	3.5	85.7	69.9
90	101.6	93.2	4.2	101.6	93.2	4.2	95.3	95.3
90 × 90 × 80	101.6	93.2	4.2	89.1	80.7	4.2	95.3	92.1
90 × 90 × 65	101.6	93.2	4.2	76.3	67.9	4.2	95.3	88.9
90 × 90 × 50	101.6	93.2	4.2	60.5	52.9	3.8	95.3	82.6
90 × 90 × 40	101.6	93.2	4.2	48.6	41.6	3.5	95.3	79.4
100	114.3	105.3	4.5	114.3	105.3	4.5	104.8	104.8
100 × 100 × 90	114.3	105.3	4.5	101.6	93.2	4.2	104.8	101.6
100 × 100 × 80	114.3	105.3	4.5	89.1	80.7	4.2	104.8	98.4
100 × 100 × 65	114.3	105.3	4.5	76.3	67.9	4.2	104.8	95.3
100 × 100 × 50	114.3	105.3	4.5	60.5	52.9	3.8	104.8	88.9
100 × 100 × 40	114.3	105.3	4.5	48.6	41.6	3.5	104.8	85.7
125	139.8	130.8	4.5	139.8	130.8	4.5	123.8	123.8
125 × 125 × 100	139.8	130.8	4.5	114.3	105.3	4.5	123.8	117.5
125 × 125 × 90	139.8	130.8	4.5	101.6	93.2	4.2	123.8	114.3
125 × 125 × 80	139.8	130.8	4.5	89.1	80.7	4.2	123.8	111.1
125 × 125 × 65	139.8	130.8	4.5	76.3	67.9	4.2	123.8	108.0
125 × 125 × 50	139.8	130.8	4.5	60.5	52.9	3.8	123.8	104.8



KS B 1522, JIS B 2311

Unit : mm

Nominal Pipe Size	Run			Outlet			Center to End	
	Outside Dia. OD <sub>1</sub>	Inside Dia. ID <sub>1</sub>	Wall Thick. T <sub>1</sub>	Outside Dia. OD <sub>2</sub>	Inside Dia. ID <sub>2</sub>	Wall Thick. T <sub>2</sub>	C	M
150	165.2	155.2	5.0	165.2	155.2	5.0	142.9	142.9
150 × 150 × 125	165.2	155.2	5.0	139.8	130.8	4.5	142.9	136.5
150 × 150 × 100	165.2	155.2	5.0	114.3	105.3	4.5	142.9	130.2
150 × 150 × 90	165.2	155.2	5.0	101.6	93.2	4.2	142.9	127.0
150 × 150 × 80	165.2	155.2	5.0	89.1	80.7	4.2	142.9	123.8
150 × 150 × 65	165.2	155.2	5.0	76.3	67.9	4.2	142.9	120.7
200	216.3	204.7	5.8	216.3	204.7	5.8	177.8	177.8
200 × 200 × 150	216.3	204.7	5.8	165.2	155.2	5.0	177.8	168.3
200 × 200 × 125	216.3	204.7	5.8	139.8	130.8	4.5	177.8	161.9
200 × 200 × 100	216.3	204.7	5.8	114.3	105.3	4.5	177.8	155.6
200 × 200 × 100	216.3	204.7	5.8	101.6	93.2	4.2	177.8	152.4
250	267.4	254.2	6.6	267.2	254.2	6.6	215.9	215.9
250 × 250 × 200	267.4	254.2	6.6	216.3	204.7	5.8	215.9	203.2
250 × 250 × 150	267.4	254.2	6.6	165.2	155.2	5.0	215.9	193.7
250 × 250 × 125	267.4	254.2	6.6	139.8	130.8	4.5	215.9	190.5
250 × 250 × 100	267.4	254.2	6.6	114.3	105.3	4.5	215.9	184.2
300	318.5	304.7	6.9	318.5	304.7	6.9	254.0	254.0
300 × 300 × 250	318.5	304.7	6.9	267.4	254.2	6.6	254.0	241.3
300 × 300 × 200	318.5	304.7	6.9	216.3	204.7	5.8	254.0	228.6
300 × 300 × 150	318.5	304.7	6.9	165.2	155.2	5.0	254.0	219.1
300 × 300 × 125	318.5	304.7	6.9	139.8	130.8	4.5	254.0	215.9
350	355.6	339.8	7.9	355.6	339.8	7.9	279.4	279.4
350 × 230 × 300	355.6	339.8	7.9	318.5	304.7	6.9	279.4	269.9
350 × 230 × 250	355.6	339.8	7.9	267.4	254.2	6.6	279.4	257.2
350 × 230 × 200	355.6	339.8	7.9	216.3	204.7	5.8	279.4	247.7
350 × 230 × 150	355.6	339.8	7.9	165.2	155.2	5.0	279.4	238.1
400	406.4	390.6	7.9	406.4	390.6	7.9	304.8	304.8
400 × 400 × 350	406.4	390.6	7.9	355.6	339.8	7.9	304.8	304.8
400 × 400 × 300	406.4	390.6	7.9	318.5	304.7	6.9	304.8	295.3
400 × 400 × 250	406.4	390.6	7.9	267.4	254.2	6.6	304.8	282.6
400 × 400 × 200	406.4	390.6	7.9	216.3	204.7	5.8	304.8	273.1
400 × 400 × 150	406.4	390.6	7.9	165.2	155.2	5.0	304.8	263.5
450	457.2	441.4	7.9	457.2	441.4	7.9	342.9	342.9
450 × 450 × 400	457.2	441.4	7.9	406.4	390.6	7.9	342.9	330.2
450 × 450 × 350	457.2	441.4	7.9	355.6	339.8	7.9	342.9	330.2
450 × 450 × 300	457.2	441.4	7.9	318.5	304.7	6.9	342.9	320.7
450 × 450 × 250	457.2	441.4	7.9	267.4	254.2	6.6	342.9	308.0
500	508.0	492.2	7.9	508.0	492.2	7.9	381.0	381.0
500 × 500 × 450	508.0	492.2	7.9	457.2	441.4	7.9	381.0	368.3
500 × 500 × 400	508.0	492.2	7.9	406.4	390.6	7.9	381.0	355.6
500 × 500 × 350	508.0	492.2	7.9	355.6	339.8	7.9	381.0	355.6
500 × 500 × 300	508.0	492.2	7.9	318.5	304.8	6.9	381.0	346.1
500 × 500 × 250	508.0	492.2	7.9	267.4	254.2	6.6	381.0	333.4
500 × 500 × 200	508.0	492.2	7.9	216.3	204.7	5.8	381.0	323.9

# STEEL BUTT-WELDING PIPE FITTINGS

KS | JIS

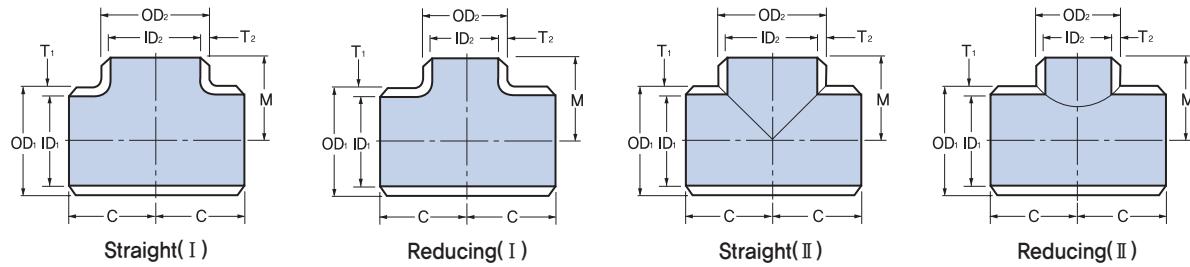
## • Tee

7.9T, STD, X-S

KS B 1541/3, JIS B 2312/3

Unit : mm

Nominal Pipe Size	Outside Diameter		Wall Thickness						Center to End	
	OD <sub>1</sub>	OD <sub>2</sub>	7.9T		STD		X-S		C	M
			T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>		
350	355.6	355.6	7.9	7.9	9.5	9.5	12.7	12.7	279.4	279.4
400	406.4	406.4	7.9	7.9	9.5	9.5	12.7	12.7	304.8	304.8
400×400×350	406.4	355.6	7.9	7.9	9.5	9.5	12.7	12.7	304.8	304.8
400×400×300	406.4	318.5	7.9	7.9	9.5	9.5	12.7	12.7	304.8	295.3
450	457.2	457.2	7.9	7.9	9.5	9.5	12.7	12.7	342.9	342.9
450×450×400	457.2	406.4	7.9	7.9	9.5	9.5	12.7	12.7	342.9	330.2
450×450×350	457.2	355.6	7.9	7.9	9.5	9.5	12.7	12.7	342.9	330.2
450×450×300	457.2	318.5	7.9	7.9	9.5	9.5	12.7	12.7	342.9	320.7
500	508.0	508.0	7.9	7.9	9.5	9.5	12.7	12.7	381.0	381.0
500×500×450	508.0	457.2	7.9	7.9	9.5	9.5	12.7	12.7	381.0	368.3
500×500×400	508.0	406.4	7.9	7.9	9.5	9.5	12.7	12.7	381.0	355.6
500×500×350	508.0	355.6	7.9	7.9	9.5	9.5	12.7	12.7	381.0	355.6
500×500×300	508.0	318.5	7.9	7.9	9.5	9.5	12.7	12.7	381.0	346.1
550	558.8	558.8	7.9	7.9	9.5	9.5	12.7	12.7	419.1	419.1
550×550×500	558.8	508.0	7.9	7.9	9.5	9.5	12.7	12.7	419.1	406.4
550×550×450	558.8	457.2	7.9	7.9	9.5	9.5	12.7	12.7	419.1	393.7
550×550×400	558.8	406.4	7.9	7.9	9.5	9.5	12.7	12.7	419.1	381.0
600	609.6	609.6	7.9	7.9	9.5	9.5	12.7	12.7	431.8	431.8
600×600×550	609.6	558.8	7.9	7.9	9.5	9.5	12.7	12.7	431.8	431.8
600×600×500	609.6	508.0	7.9	7.9	9.5	9.5	12.7	12.7	431.8	431.8
600×600×450	609.6	457.2	7.9	7.9	9.5	9.5	12.7	12.7	431.8	419.1
650	660.4	660.4	7.9	7.9	9.5	9.5	12.7	12.7	495.3	495.3
650×650×600	660.4	609.6	7.9	7.9	9.5	9.5	12.7	12.7	495.3	482.6
650×650×550	660.4	558.8	7.9	7.9	9.5	9.5	12.7	12.7	495.3	469.9
650×650×500	660.4	508.0	7.9	7.9	9.5	9.5	12.7	12.7	495.3	457.2
700	711.2	711.2	7.9	7.9	9.5	9.5	12.7	12.7	520.7	520.7
700×700×650	711.2	660.4	7.9	7.9	9.5	9.5	12.7	12.7	520.7	520.7
700×700×600	711.2	609.6	7.9	7.9	9.5	9.5	12.7	12.7	520.7	508.0
700×700×550	711.2	558.8	7.9	7.9	9.5	9.5	12.7	12.7	520.7	495.3
750	762.0	762.0	7.9	7.9	9.5	9.5	12.7	12.7	558.8	558.8
750×750×700	762.0	711.2	7.9	7.9	9.5	9.5	12.7	12.7	558.8	546.1
750×750×650	762.0	660.4	7.9	7.9	9.5	9.5	12.7	12.7	558.8	546.1
750×750×600	762.0	609.6	7.9	7.9	9.5	9.5	12.7	12.7	558.8	533.4



KS B 1541/3, JIS B 2312/3

Unit : mm

Nominal Pipe Size	Outside Diameter		Wall Thickness						Center to End	
	OD <sub>1</sub>	OD <sub>2</sub>	7.9T		STD		X-S		C	M
			T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>		
800	812.8	812.8	7.9	7.9	9.5	9.5	12.7	12.7	596.9	596.9
800 × 800 × 750	812.8	762.0	7.9	7.9	9.5	9.5	12.7	12.7	596.9	584.2
800 × 800 × 700	812.8	711.2	7.9	7.9	9.5	9.5	12.7	12.7	596.9	571.5
800 × 800 × 650	508.0	660.4	7.9	7.9	9.5	9.5	12.7	12.7	596.9	571.5
850	863.6	863.6	7.9	7.9	9.5	9.5	12.7	12.7	635.0	635.0
850 × 850 × 800	863.6	812.8	7.9	7.9	9.5	9.5	12.7	12.7	635.0	522.3
850 × 850 × 750	863.6	762.0	7.9	7.9	9.5	9.5	12.7	12.7	635.0	609.6
850 × 850 × 700	863.6	711.2	7.9	7.9	9.5	9.5	12.7	12.7	635.0	596.9
900	914.4	914.4	7.9	7.9	9.5	9.5	12.7	12.7	673.1	673.1
900 × 900 × 850	914.4	863.6	7.9	7.9	9.5	9.5	12.7	12.7	673.1	660.4
900 × 900 × 800	914.4	812.8	7.9	7.9	9.5	9.5	12.7	12.7	673.1	647.7
900 × 900 × 750	914.4	762.0	7.9	7.9	9.5	9.5	12.7	12.7	673.1	635.0
950	965.2	965.2	7.9	7.9	9.5	9.5	12.7	12.7	711.2	711.2
950 × 950 × 900	965.2	914.4	7.9	7.9	9.5	9.5	12.7	12.7	711.2	711.2
950 × 950 × 850	965.2	863.6	7.9	7.9	9.5	9.5	12.7	12.7	711.2	698.5
950 × 950 × 800	965.2	812.8	7.9	7.9	9.5	9.5	12.7	12.7	711.2	685.8
1000	1016.0	1016.0	7.9	7.9	9.5	9.5	12.7	12.7	749.3	749.3
1000 × 1000 × 950	1016.0	965.2	7.9	7.9	9.5	9.5	12.7	12.7	749.3	749.3
1000 × 1000 × 900	1016.0	914.4	7.9	7.9	9.5	9.5	12.7	12.7	749.3	736.6
1000 × 1000 × 850	1016.0	863.6	7.9	7.9	9.5	9.5	12.7	12.7	749.3	723.9
1050	1066.8	1066.8	7.9	7.9	9.5	9.5	12.7	12.7	762.0	711.2
1050 × 1050 × 1000	1066.8	1016.0	7.9	7.9	9.5	9.5	12.7	12.7	762.0	711.2
1050 × 1050 × 950	1066.8	965.2	7.9	7.9	9.5	9.5	12.7	12.7	762.0	711.2
1050 × 1050 × 900	1066.8	914.4	7.9	7.9	9.5	9.5	12.7	12.7	762.0	711.2
1100	1117.6	1117.6	7.9	7.9	9.5	9.5	12.7	12.7	812.8	762.0
1100 × 1100 × 1050	1117.6	1066.8	7.9	7.9	9.5	9.5	12.7	12.7	812.8	762.0
1100 × 1100 × 1000	1117.6	1016.0	7.9	7.9	9.5	9.5	12.7	12.7	812.8	749.3
1100 × 1100 × 950	1117.6	965.2	7.9	7.9	9.5	9.5	12.7	12.7	812.8	736.6
1150	1168.4	1168.4	7.9	7.9	9.5	9.5	12.7	12.7	850.9	800.1
1150 × 1150 × 1100	1168.4	1117.6	7.9	7.9	9.5	9.5	12.7	12.7	850.9	800.1
1150 × 1150 × 1050	1168.4	1066.8	7.9	7.9	9.5	9.5	12.7	12.7	850.9	787.4
1150 × 1150 × 1000	1168.4	1016.0	7.9	7.9	9.5	9.5	12.7	12.7	850.9	774.7
1200	1219.2	1219.2	7.9	7.9	9.5	9.5	12.7	12.7	889.0	838.2
1200 × 1200 × 1150	1219.2	1168.4	7.9	7.9	9.5	9.5	12.7	12.7	889.0	838.2
1200 × 1200 × 1100	1219.2	1117.6	7.9	7.9	9.5	9.5	12.7	12.7	889.0	838.2
1200 × 1200 × 1050	1219.2	1066.8	7.9	7.9	9.5	9.5	12.7	12.7	889.0	812.8

# STEEL BUTT-WELDING PIPE FITTINGS

KS | JIS

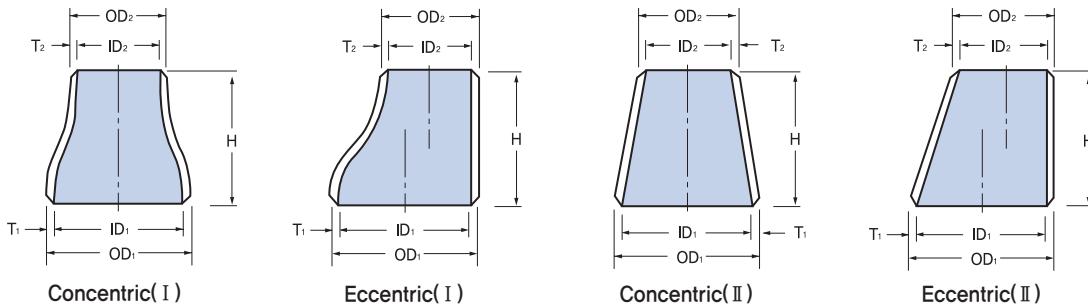
## • Reducer

SPP/SGP

KS B 1522, JIS B 2311

Unit : mm

Nominal Pipe Size	Large End			Small End			End to End H
	Outside Diameter OD <sub>1</sub>	Inside Diameter ID <sub>1</sub>	Wall Thickness T <sub>1</sub>	Outside Diameter OD <sub>2</sub>	Inside Diameter ID <sub>2</sub>	Wall Thickness T <sub>2</sub>	
20× 15	27.2	21.6	2.8	21.7	16.1	2.8	38.1
25× 20	34.0	27.6	3.2	27.2	21.6	2.8	50.8
25× 15	34.0	27.6	3.2	21.7	16.1	2.8	50.8
32× 25	42.7	35.7	3.5	34.0	27.6	3.2	50.8
32× 20	42.7	35.7	3.5	27.2	21.6	2.8	50.8
32× 15	42.7	35.7	3.5	21.7	16.1	2.8	50.8
40× 32	48.6	41.6	3.5	42.7	35.7	3.5	63.5
40× 25	48.6	41.6	3.5	34.0	27.6	3.2	63.5
40× 20	48.6	41.6	3.5	27.2	21.6	2.8	63.5
40× 15	48.6	41.6	3.5	21.7	16.1	2.8	63.5
50× 40	60.5	52.9	3.8	48.6	41.6	3.5	76.2
50× 32	60.5	52.9	3.8	42.7	35.7	3.5	76.2
50× 25	60.5	52.9	3.8	34.0	27.6	3.2	76.2
50× 20	60.5	52.9	3.8	27.2	21.6	2.8	76.2
65× 50	76.3	67.9	4.2	60.5	52.9	3.8	88.9
65× 40	76.3	67.9	4.2	48.6	41.6	3.5	88.9
65× 32	76.3	67.9	4.2	42.7	35.7	3.5	88.9
65× 25	76.3	67.9	4.2	34.0	27.6	3.2	88.9
80× 65	89.1	80.7	4.2	76.3	67.9	4.2	88.9
80× 50	89.1	80.7	4.2	60.5	52.9	3.8	88.9
80× 40	89.1	80.7	4.2	48.6	41.6	3.5	88.9
80× 32	89.1	80.7	4.2	42.7	35.7	3.5	88.9
90× 80	101.6	93.2	4.2	89.1	80.7	4.2	101.6
90× 65	101.6	93.2	4.2	76.3	67.9	4.2	101.6
90× 50	101.6	93.2	4.2	60.5	52.9	3.8	101.6
90× 40	101.6	93.2	4.2	48.6	41.6	3.5	101.6
90× 32	101.6	93.2	4.2	42.7	35.7	3.5	101.6
100× 90	114.3	105.3	4.5	101.6	93.2	4.2	101.6
100× 80	114.3	105.3	4.5	89.1	80.7	4.2	101.6
100× 65	114.3	105.3	4.5	76.3	67.9	4.2	101.6
100× 50	114.3	105.3	4.5	60.5	52.9	3.8	101.6
100× 40	114.3	105.3	4.5	48.6	41.6	3.5	101.6
125× 100	139.8	130.8	4.5	114.3	105.3	4.5	127.0
125× 90	139.8	130.8	4.5	101.6	93.2	4.2	127.0
125× 80	139.8	130.8	4.5	89.1	80.7	4.2	127.0
125× 65	139.8	130.8	4.5	76.3	67.9	4.2	127.0
125× 50	139.8	130.8	4.5	60.5	52.9	3.8	127.0



KS B 1522, JIS B 2311

Unit : mm

Nominal Pipe Size	Large End			Small End			End to End H
	Outside Diameter OD <sub>1</sub>	Inside Diameter ID <sub>1</sub>	Wall Thickness T <sub>1</sub>	Outside Diameter OD <sub>2</sub>	Inside Diameter ID <sub>2</sub>	Wall Thickness T <sub>2</sub>	
150×125	165.2	155.2	5.0	139.8	130.8	4.5	139.7
150×100	165.2	155.2	5.0	114.3	105.3	4.5	139.7
150×90	165.2	155.2	5.0	101.6	93.2	4.2	139.7
150×80	165.2	155.2	5.0	89.1	80.7	4.2	139.7
150×65	165.2	155.2	5.0	76.3	67.9	4.2	139.7
200×150	216.3	204.7	5.8	165.2	155.2	5.0	152.4
200×125	216.3	204.7	5.8	139.8	130.8	4.5	152.4
200×100	216.3	204.7	5.8	114.3	105.3	4.5	152.4
200×90	216.3	204.7	5.8	101.6	93.2	4.2	152.4
250×200	267.4	254.2	6.6	216.3	204.7	5.8	177.8
250×150	267.4	254.2	6.6	165.2	155.2	5.0	177.8
250×125	267.4	254.2	6.6	139.8	130.8	4.5	177.8
250×100	267.4	254.2	6.6	114.3	105.3	4.5	177.8
300×250	318.5	304.7	6.9	267.4	254.2	6.6	203.2
300×200	318.5	304.7	6.9	216.3	204.7	5.8	203.2
300×150	318.5	304.7	6.9	165.2	155.2	5.0	203.2
300×125	318.5	304.7	6.9	139.8	130.8	4.5	203.3
350×300	355.6	339.8	7.9	318.5	304.7	6.9	330.2
350×250	355.6	339.8	7.9	267.4	254.2	6.6	330.2
350×200	355.6	339.8	7.9	216.3	204.7	5.8	330.2
350×150	355.6	339.8	7.9	165.2	155.2	5.0	330.2
400×350	406.4	390.6	7.9	355.6	339.8	7.9	355.6
400×300	406.4	390.6	7.9	318.5	304.7	6.9	355.6
400×250	406.4	390.6	7.9	267.4	254.2	6.6	355.6
400×200	406.4	390.6	7.9	216.3	204.7	5.8	355.6
450×400	457.2	441.4	7.9	406.4	390.6	7.9	381.0
450×350	457.2	441.4	7.9	355.6	339.8	7.9	381.0
450×300	457.2	441.4	7.9	318.5	304.7	6.9	381.0
450×250	457.2	441.4	7.9	267.4	254.2	6.6	381.0
500×450	508.0	492.2	7.9	457.2	441.4	7.9	508.0
500×400	508.0	492.2	7.9	406.4	390.6	7.9	508.0
500×350	508.0	492.2	7.9	355.6	339.8	7.9	508.0
500×300	508.0	492.2	7.9	318.5	304.7	6.9	508.0

# STEEL BUTT-WELDING PIPE FITTINGS

KS | JIS

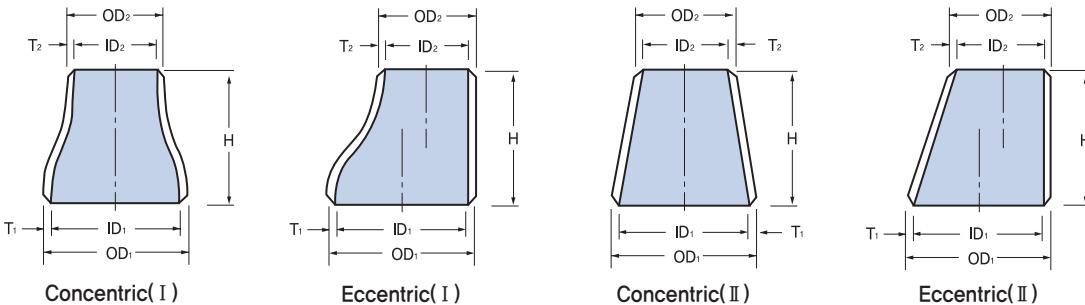
## • Reducer

7.9T, STD, X-S

KS B 1541/3, JIS B 2312/3

Unit : mm

Nominal Pipe Size	Outside Diameter		Wall Thickness T						End to End H	
	OD <sub>1</sub>	OD <sub>2</sub>	7.9T		STD		X-S			
			T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>		
400×350	406.4	355.6	7.9	7.9	9.5	9.5	12.7	12.7	355.6	
450×400	457.2	406.4	7.9	7.9	9.5	9.5	12.7	12.7	381.0	
450×350	457.2	355.6	7.9	7.9	9.5	9.5	12.7	12.7	381.0	
500×450	508.0	457.2	7.9	7.9	9.5	9.5	12.7	12.7	508.0	
500×400	508.0	406.4	7.9	7.9	9.5	9.5	12.7	12.7	508.0	
500×350	508.0	355.6	7.9	7.9	9.5	9.5	12.7	12.7	508.0	
550×500	558.8	508.0	7.9	7.9	9.5	9.5	12.7	12.7	508.0	
550×450	558.8	457.2	7.9	7.9	9.5	9.5	12.7	12.7	508.0	
550×400	558.8	406.4	7.9	7.9	9.5	9.5	12.7	12.7	508.0	
550×350	558.8	355.6	7.9	7.9	9.5	9.5	12.7	12.7	508.0	
600×550	609.6	558.8	7.9	7.9	9.5	9.5	12.7	12.7	508.0	
600×500	609.6	508.0	7.9	7.9	9.5	9.5	12.7	12.7	508.0	
600×450	609.6	457.2	7.9	7.9	9.5	9.5	12.7	12.7	508.0	
600×400	609.6	406.4	7.9	7.9	9.5	9.5	12.7	12.7	508.0	
650×600	660.4	609.6	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
650×550	660.4	558.8	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
650×500	660.4	508.0	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
650×450	660.4	457.2	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
700×650	711.2	660.4	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
700×600	711.2	609.6	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
700×550	711.2	558.8	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
700×500	711.2	508.0	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
750×700	762.0	711.2	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
750×650	762.0	660.4	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
750×600	762.0	609.6	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
750×550	762.0	558.8	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
800×750	812.8	760.0	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
800×700	812.8	711.2	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
800×650	812.8	660.4	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
800×600	812.8	609.6	7.9	7.9	9.5	9.5	12.7	12.7	609.6	



KS B 1541/3, JIS B 2312/3

Unit : mm

Nominal Pipe Size	Outside Diameter		Wall Thickness						End to End H	
	OD <sub>1</sub>	OD <sub>2</sub>	7.9T		STD		X-S			
			T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>		
850× 800	863.6	812.8	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
850× 750	863.6	762.0	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
850× 700	863.6	711.2	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
850× 650	863.6	660.4	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
900× 850	914.4	863.6	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
900× 800	914.4	812.8	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
900× 750	914.4	762.0	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
900× 700	914.4	711.2	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
950× 900	965.2	914.4	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
950× 850	965.2	863.6	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
950× 800	965.2	812.8	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
950× 750	965.2	762.0	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
1000× 950	1016.0	965.2	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
1000× 900	1016.0	914.4	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
1000× 850	1016.0	863.6	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
1000× 800	1016.0	812.8	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
1050×1000	1066.8	1016.0	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
1050× 950	1066.8	965.2	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
1050× 900	1066.8	914.4	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
1050× 850	1066.8	863.6	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
1100×1050	1117.6	1066.8	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
1100×1000	1117.6	1016.0	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
1100× 950	1117.6	965.2	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
1100× 900	1117.6	914.4	7.9	7.9	9.5	9.5	12.7	12.7	609.6	
1150×1100	1168.4	1117.6	7.9	7.9	9.5	9.5	12.7	12.7	711.2	
1150× 1050	1168.4	1066.8	7.9	7.9	9.5	9.5	12.7	12.7	711.2	
1150× 1000	1168.4	1016.0	7.9	7.9	9.5	9.5	12.7	12.7	711.2	
1150× 950	1168.4	965.2	7.9	7.9	9.5	9.5	12.7	12.7	711.2	
1200×1150	1219.2	1168.4	7.9	7.9	9.5	9.5	12.7	12.7	711.2	
1200×1100	1219.2	1117.6	7.9	7.9	9.5	9.5	12.7	12.7	711.2	
1200× 1050	1219.2	1066.8	7.9	7.9	9.5	9.5	12.7	12.7	711.2	
1200× 1000	1219.2	1016.0	7.9	7.9	9.5	9.5	12.7	12.7	711.2	

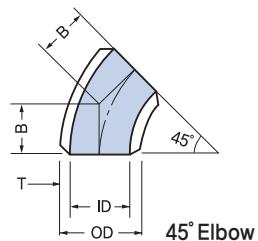
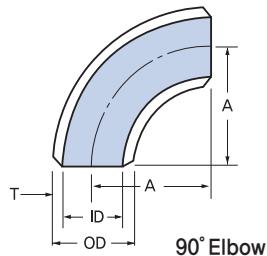
# STEEL BUTT-WELDING PIPE FITTINGS

KS | JIS

- **90° Elbow (Long,Short)**

- **45° Elbow (Long)**

Sch40, Sch80, Sch120, Sch160



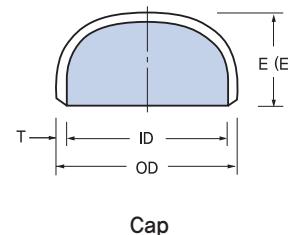
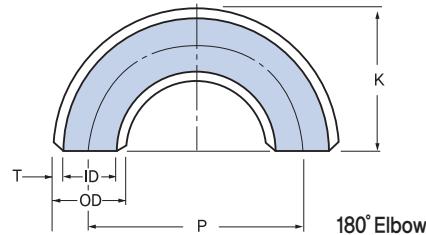
KS B 1541/43, JIS B 2312/13

Unit : mm

Nominal Pipe Size	Outside Diameter OD	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	274.8	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

**• 180° Elbow (Long,Short)**
**• Cap**

Sch40, Sch80, Sch120, Sch160



KS B 1541/43, JIS B 2312/13

Unit : mm

Nominal Pipe Size	Outside Diameter OD	Wall Thickness T				Cap			180° Elbow			
		Sch 40	Sch 80	Sch 120	Sch 160	E	E <sub>1</sub>	Limited Wall Thickness For E	P	K	P	K
15	21.7	2.8	3.7	-	-	25.4	-	-	76.2	49.0	-	-
20	27.2	2.9	3.9	-	-	25.4	-	-	76.2	51.7	-	-
25	34.0	3.4	4.5	-	-	38.1	-	-	76.2	55.1	50.8	42.4
32	42.7	3.6	4.9	-	-	38.1	-	-	95.2	69.0	63.6	53.2
40	48.6	3.7	5.1	-	7.1	38.1	-	-	114.4	81.5	76.2	62.4
50	60.5	3.9	5.5	-	8.7	38.1	44.5	5.5	152.4	106.5	101.6	81.1
65	76.3	5.2	7.0	-	9.5	38.1	50.8	7.0	190.6	133.5	127.0	101.7
80	89.1	5.5	7.6	-	11.1	50.8	63.5	7.6	228.6	158.9	152.4	120.8
90	101.6	5.7	8.1	-	12.7	63.5	76.2	8.1	266.8	184.2	177.8	139.7
100	114.3	6.0	8.6	11.1	13.5	63.5	76.2	8.6	304.8	209.6	203.2	158.8
125	139.8	6.6	9.5	12.7	15.9	76.2	88.9	9.5	381.0	260.4	254.0	196.9
150	165.2	7.1	11.0	14.3	18.2	88.9	101.6	11.0	457.2	311.2	304.8	235.0
200	216.3	8.2	12.7	18.2	23.0	101.6	127.0	12.7	609.6	413.0	406.4	311.4
250	267.4	9.3	15.1	21.4	28.6	127.0	152.4	12.7	762.0	514.7	508.0	387.7
300	318.5	10.3	17.4	25.4	33.3	152.4	177.8	12.7	914.4	616.5	609.6	464.1
350	355.6	11.1	19.0	27.8	35.7	165.1	190.5	12.7	1066.8	711.2	711.2	533.4
400	406.4	12.7	21.4	30.9	40.5	177.8	203.2	12.7	1219.2	812.8	812.8	609.6
450	457.2	14.3	23.8	34.9	45.2	203.2	228.6	12.7	1371.6	914.4	914.4	685.8
500	508.0	15.1	26.2	38.1	50.0	228.6	254.0	12.7	1524.0	1016.0	1016.0	762.0

# STEEL BUTT-WELDING PIPE FITTINGS

KS | JIS

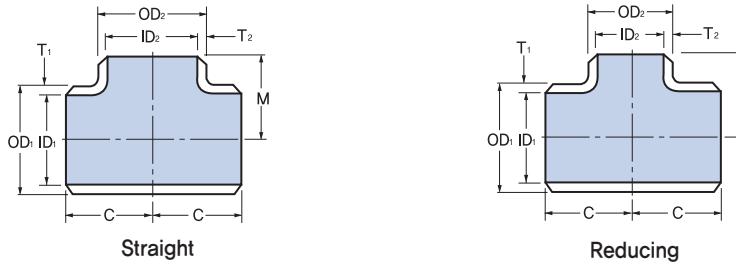
## • Tee

Sch40, Sch80, Sch120, Sch160

KS B 1541/43, JIS B 2312/13

Unit : mm

Nominal Pipe Size	Outside Diameter		Sch 40		Sch 80		Sch 120		Sch 160		Center-to-End	
	OD <sub>1</sub>	OD <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	C	M						
15	21.7	21.7	2.8	2.8	3.7	3.7	-	-	-	-	25.4	25.4
20	27.2	27.2	2.9	2.9	3.9	3.9	-	-	-	-	28.6	28.6
20× 20×15	27.2	21.7	2.9	2.8	3.9	3.7	-	-	-	-	28.6	28.6
25	34.0	34.0	3.4	3.4	4.5	4.5	-	-	-	-	38.1	38.1
25× 25×20	34.0	27.2	3.4	2.9	4.5	3.9	-	-	-	-	38.1	38.1
25× 25×15	34.0	21.7	3.4	2.8	4.5	3.7	-	-	-	-	38.1	38.1
32	42.7	42.7	3.6	3.6	4.9	4.9	-	-	-	-	47.6	47.6
32× 32×25	42.7	34.0	3.6	3.4	4.9	4.5	-	-	-	-	47.6	47.6
32× 32×20	42.7	27.2	3.6	2.9	4.9	3.9	-	-	-	-	47.6	47.6
32× 32×15	42.7	21.7	3.6	2.8	4.9	3.7	-	-	-	-	47.6	47.6
40	48.6	48.6	3.7	3.7	5.1	5.1	-	-	7.1	7.1	57.2	57.2
40× 40×32	48.6	42.7	3.7	3.6	5.1	4.9	-	-	-	-	57.2	57.2
40× 40×25	48.6	34.0	3.7	3.4	5.1	4.5	-	-	-	-	57.2	57.2
40× 40×20	48.6	27.2	3.7	2.9	5.1	3.9	-	-	-	-	57.2	57.2
40× 40×15	48.6	21.7	3.7	2.8	5.1	3.7	-	-	-	-	57.2	57.2
50	60.5	60.5	3.9	3.9	5.5	5.5	-	-	8.7	8.7	63.5	63.5
50× 50×40	60.5	48.6	3.9	3.7	5.5	5.1	-	-	8.7	7.1	63.5	60.3
50× 50×32	60.5	42.7	3.9	3.6	5.5	4.9	-	-	-	-	63.5	57.2
50× 50×25	60.5	34.0	3.9	3.4	5.5	4.5	-	-	-	-	63.5	50.8
50× 50×20	60.5	27.2	3.9	2.9	5.5	3.9	-	-	-	-	63.5	44.5
65	76.3	76.3	5.2	5.2	7.0	7.0	-	-	9.5	9.5	76.2	76.2
65× 65×50	76.3	60.5	5.2	3.9	7.0	5.5	-	-	9.5	8.7	76.2	69.9
65× 65×40	76.3	48.6	5.2	3.7	7.0	5.1	-	-	9.5	7.1	76.2	66.7
65× 65×32	76.3	42.7	5.2	3.6	7.0	4.9	-	-	-	-	76.2	63.5
65× 65×25	76.3	34.0	5.2	3.4	7.0	4.5	-	-	-	-	76.2	57.2
80	89.1	89.1	5.5	5.5	7.6	7.6	-	-	11.1	11.1	85.7	85.7
80× 80×65	89.1	76.3	5.5	5.2	7.6	7.0	-	-	11.1	9.5	85.7	82.6
80× 80×50	89.1	60.5	5.5	3.9	7.6	5.5	-	-	11.1	8.7	85.7	76.2
80× 80×40	89.1	48.6	5.5	3.7	7.6	5.1	-	-	11.1	7.1	85.7	73.0
80× 80×32	89.1	42.7	5.5	3.6	7.6	4.9	-	-	-	-	85.7	69.9
90	101.6	101.6	5.7	5.7	8.1	8.1	-	-	12.7	12.7	95.3	95.3
90× 90×80	101.6	89.1	5.7	5.5	8.1	7.6	-	-	12.7	11.1	95.3	92.1
90× 90×65	101.6	76.3	5.7	5.2	8.1	7.0	-	-	12.7	9.5	95.3	88.9
90× 90×50	101.6	60.5	5.7	3.9	8.1	5.5	-	-	12.7	8.7	95.3	82.6
90× 90×40	101.6	48.6	5.7	3.7	8.1	5.1	-	-	12.7	7.1	95.3	79.4
100	114.3	114.3	6.0	6.0	8.6	8.6	11.1	11.1	13.5	13.5	104.8	104.8
100× 100×90	114.3	101.6	6.0	5.7	8.6	8.1	-	-	13.5	12.7	104.8	101.6
100× 100×80	114.3	89.1	6.0	5.5	8.6	7.6	-	-	13.5	11.1	104.8	98.4
100× 100×65	114.3	76.3	6.0	5.2	8.6	7.0	-	-	13.5	9.5	104.8	95.3
100× 100×50	114.3	60.3	6.0	3.9	8.6	5.5	-	-	13.5	8.7	104.8	88.9
100× 100×40	114.3	48.6	6.0	3.7	8.6	5.1	-	-	13.5	7.1	104.8	85.7



KS B 1541/43, JIS B 2312/13

Unit : mm

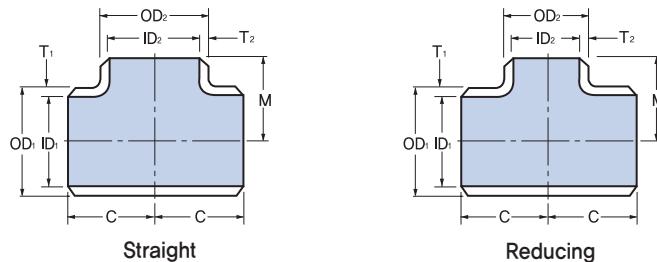
Nominal Pipe Size	Outside Diameter		Sch 40		Sch 80		Sch 120		Sch 160		Center-to-End	
	OD <sub>1</sub>	OD <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	C	M						
125	139.8	139.8	6.6	6.6	9.5	9.5	12.7	12.7	15.9	15.9	123.8	123.8
125×125×100	139.8	114.3	6.6	6.0	9.5	8.6	12.7	11.1	15.9	13.5	123.8	117.5
125×125× 90	139.8	101.6	6.6	5.7	9.5	8.1	-	-	15.9	12.7	123.8	114.3
125×125× 80	139.8	89.1	6.6	5.5	9.5	7.6	-	-	15.9	11.1	123.8	111.1
125×125× 65	139.8	76.3	6.6	5.2	9.5	7.0	-	-	15.9	9.5	123.8	108.0
125×125× 50	139.8	60.5	6.6	3.9	9.5	5.5	-	-	15.9	8.7	123.8	104.8
150	165.2	165.2	7.1	7.1	11.0	11.0	14.3	14.3	18.2	18.2	142.9	142.9
150×150×125	165.2	139.8	7.1	6.6	11.0	9.5	14.3	12.7	18.2	15.9	142.9	136.5
150×150×100	165.2	114.3	7.1	6.0	11.0	8.6	14.3	11.1	18.2	13.5	142.9	130.2
150×150× 90	165.2	101.6	7.1	5.7	11.0	8.1	-	-	18.2	12.7	142.9	127.0
150×150× 80	165.2	89.1	7.1	5.5	11.0	7.6	-	-	18.2	11.1	142.9	123.8
150×150× 65	165.2	76.3	7.1	5.2	11.0	7.0	-	-	18.2	9.5	142.9	120.7
200	216.3	216.3	8.2	8.2	12.7	12.7	18.2	18.2	23.0	23.0	177.8	177.8
200×200×150	216.3	165.2	8.2	7.1	12.7	11.0	18.2	14.3	23.0	18.2	177.8	168.3
200×200×125	216.3	139.8	8.2	6.6	12.7	9.5	18.2	12.7	23.0	15.9	177.8	161.9
200×200×100	216.3	114.3	8.2	6.0	12.7	8.6	18.2	11.1	23.0	13.5	177.8	155.6
200×200×100	216.3	101.6	8.2	5.7	12.7	8.1	-	-	23.0	12.7	177.8	152.4
250	267.4	267.2	9.3	9.3	15.1	15.1	21.4	21.4	28.6	28.6	215.9	215.9
250×250×200	267.4	216.3	9.3	8.2	15.1	12.7	21.4	18.2	28.6	23.0	215.9	203.2
250×250×150	267.4	165.2	9.3	7.1	15.1	11.0	21.4	14.3	28.6	18.2	215.9	193.7
250×250×125	267.4	139.8	9.3	6.6	15.1	9.5	21.4	12.7	28.6	15.9	215.9	190.5
250×250×100	267.4	114.3	9.3	6.0	15.1	8.6	21.4	11.1	28.6	13.5	215.9	184.2
300	318.5	318.5	10.3	10.3	17.4	17.4	25.4	25.4	33.3	33.3	254.0	254.0
300×300×250	318.5	267.4	10.3	9.3	17.4	15.1	25.4	21.4	33.3	28.6	254.0	241.3
300×300×200	318.5	216.3	10.3	8.2	17.4	12.7	25.4	18.2	33.3	23.0	254.0	228.6
300×300×150	318.5	165.2	10.3	7.1	17.4	11.0	25.4	14.3	33.3	18.2	254.0	219.1
300×300×125	318.5	139.8	10.3	6.6	17.4	9.5	25.4	12.7	33.3	15.9	254.0	215.9
350	355.6	355.6	11.1	11.1	19.0	19.0	27.8	27.8	35.7	35.7	279.4	279.4
350×230×300	355.6	318.5	11.1	10.3	19.0	17.4	27.8	25.4	35.7	33.3	279.4	269.9
350×230×250	355.6	267.4	11.1	9.3	19.0	15.1	27.8	21.4	35.7	28.6	279.4	257.2
350×230×200	355.6	216.3	11.1	8.2	19.0	12.7	27.8	18.2	35.7	23.0	279.4	247.7
350×230×150	355.6	165.2	11.1	7.1	19.0	11.0	27.8	14.3	35.7	18.2	279.4	238.1
400	406.4	406.4	12.7	12.7	21.4	21.4	30.9	30.9	40.5	40.5	304.8	304.8
400×400×350	406.4	355.6	12.7	11.1	21.4	19.0	30.9	27.8	40.5	35.7	304.8	304.8
400×400×300	406.4	318.5	12.7	10.3	21.4	17.4	30.9	25.4	40.5	33.3	304.8	295.3
400×400×250	406.4	267.4	12.7	9.3	21.4	15.1	30.9	21.4	40.5	28.6	304.8	282.6
400×400×200	406.4	216.3	12.7	8.2	21.4	12.7	30.9	18.2	40.5	23.0	304.8	273.1
400×400×150	406.4	165.2	12.7	7.1	21.4	11.0	30.9	14.3	40.5	18.2	304.8	263.5
450	457.2	457.2	14.3	14.3	23.8	23.8	34.9	34.9	45.2	45.2	342.9	342.9
450×450×400	457.2	406.4	14.3	12.7	23.8	21.4	34.9	30.9	45.2	40.5	342.9	330.2
450×450×350	457.2	355.6	14.3	11.1	23.8	19.0	34.9	27.8	45.2	35.7	342.9	330.2
450×450×300	457.2	318.5	14.3	10.3	23.8	17.4	34.9	25.4	45.2	33.3	342.9	320.7

# STEEL BUTT-WELDING PIPE FITTINGS

KS | JIS

## • Tee

Sch40, Sch80, Sch120, Sch160



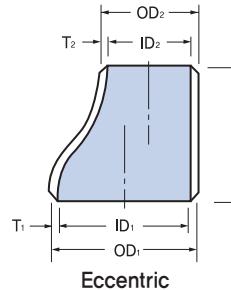
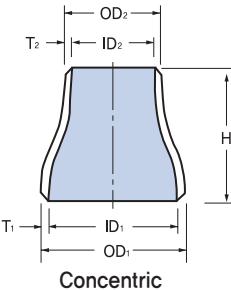
KS B 1541/43, JIS B 2312/13

Unit : mm

Nominal Pipe Size	Outside Diameter		Sch 40		Sch 80		Sch 120		Sch 160		Center-to-End	
	OD <sub>1</sub>	OD <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	C	M						
450×450×250	457.2	267.4	14.3	9.3	23.8	15.1	34.9	21.4	45.2	28.6	342.9	308.0
450×450×200	457.2	216.3	14.3	8.2	23.8	12.7	34.9	18.2	45.2	23.0	342.9	298.5
500	508.0	508.0	15.1	15.1	26.2	26.2	38.1	38.1	50.0	50.0	381.0	381.0
500×500×450	508.0	457.2	15.1	14.3	26.2	23.8	38.1	34.9	50.0	45.2	381.0	368.3
500×500×400	508.0	406.4	15.1	12.7	26.2	21.4	38.1	30.9	50.0	40.5	381.0	355.6
500×500×350	508.0	355.6	15.1	11.1	26.2	19.0	38.1	27.8	50.0	35.7	381.0	355.6
500×500×300	508.0	318.5	15.1	10.3	26.2	17.4	38.1	25.4	50.0	33.3	381.0	346.1
500×500×250	508.0	267.4	15.1	9.3	26.2	15.1	38.1	21.4	50.0	28.6	381.0	333.4
500×500×200	508.0	216.3	15.1	8.2	26.2	12.7	38.1	18.2	50.0	23.0	381.0	323.9
550	558.8	558.8	15.1	15.1	28.6	28.6	-	-	-	-	419.1	419.1
550×550×500	558.8	508.0	15.1	15.1	28.6	26.2	-	-	-	-	419.1	406.4
550×550×450	558.8	457.2	15.1	14.3	28.6	23.8	-	-	-	-	419.1	393.7
550×550×400	558.8	406.4	15.1	12.7	28.6	21.4	-	-	-	-	419.1	381.0
600	609.6	609.6	17.4	17.4	31.0	31.0	-	-	-	-	431.8	431.8
600×600×550	609.6	558.8	17.4	15.1	31.0	28.6	-	-	-	-	431.8	431.8
600×600×500	609.6	508.0	17.4	15.1	31.0	26.2	-	-	-	-	431.8	431.8
600×600×450	609.6	457.2	17.4	14.3	31.0	23.8	-	-	-	-	431.8	419.1
650	660.4	660.4	17.4	17.4	-	-	-	-	-	-	495.3	495.3
650×650×600	660.4	609.6	17.4	17.4	-	-	-	-	-	-	495.3	482.6
650×650×550	660.4	558.8	17.4	15.1	-	-	-	-	-	-	495.3	469.9
650×650×500	660.4	508.0	17.4	15.1	-	-	-	-	-	-	495.3	457.2
700	711.2	711.2	17.4	17.4	-	-	-	-	-	-	520.7	520.7
700×700×650	711.2	660.4	17.4	17.4	-	-	-	-	-	-	520.7	520.7
700×700×600	711.2	609.6	17.4	17.4	-	-	-	-	-	-	520.7	508.0
700×700×550	711.2	558.8	17.4	15.1	-	-	-	-	-	-	520.7	495.3
750	762.0	762.0	17.4	17.4	-	-	-	-	-	-	558.8	558.8
750×750×700	762.0	711.2	17.4	17.4	-	-	-	-	-	-	558.8	546.1
750×750×650	762.0	660.4	17.4	17.4	-	-	-	-	-	-	558.8	546.1
750×750×600	762.0	609.6	17.4	17.4	-	-	-	-	-	-	558.8	533.4
800	812.8	812.8	17.4	17.4	-	-	-	-	-	-	596.9	596.9
800×800×750	812.8	762.0	17.4	17.4	-	-	-	-	-	-	596.9	584.2
800×800×700	812.8	711.2	17.4	17.4	-	-	-	-	-	-	596.9	571.5
800×800×650	508.0	660.4	17.4	17.4	-	-	-	-	-	-	596.9	571.5
850	863.6	863.6	17.4	17.4	-	-	-	-	-	-	635.0	635.0
850×850×800	863.6	812.8	17.4	17.4	-	-	-	-	-	-	635.0	522.3
850×850×750	863.6	762.0	17.4	17.4	-	-	-	-	-	-	635.0	609.6
850×850×700	863.6	711.2	17.4	17.4	-	-	-	-	-	-	635.0	596.9
900	914.4	914.4	19.0	19.0	-	-	-	-	-	-	673.1	673.1
900×900×850	914.4	863.6	19.0	17.4	-	-	-	-	-	-	673.1	660.4
900×900×800	914.4	812.8	19.0	17.4	-	-	-	-	-	-	673.1	647.7
900×900×750	914.4	762.0	19.0	17.4	-	-	-	-	-	-	673.1	635.0

## • Reducer

Sch 40, Sch 80, Sch 160



KS B 1541/3, JIS B 2312/3

Unit : mm

Nominal Pipe Size	Outside Diameter		Wall Thickness						End to End H	
	OD <sub>1</sub>	OD <sub>2</sub>	Sch 40		Sch 80		Sch 160			
			T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>		
20×15	27.2	21.7	2.9	2.8	3.9	3.7	-	-	38.1	
25×20	34.0	27.2	3.4	2.9	4.5	3.9	-	-	50.8	
25×15	34.0	21.7	3.4	2.8	4.5	3.7	-	-	50.8	
32×25	42.7	34.0	3.6	3.4	4.9	4.5	-	-	50.8	
32×20	42.7	27.2	3.6	2.9	4.9	3.9	-	-	50.8	
32×15	42.7	21.7	3.6	2.8	4.9	3.7	-	-	50.8	
40×32	48.6	42.7	3.7	3.6	5.1	4.9	-	-	63.5	
40×25	48.6	34.0	3.7	3.4	5.1	4.5	-	-	63.5	
40×20	48.6	27.2	3.7	2.9	5.1	3.9	-	-	63.5	
40×15	48.6	21.7	3.7	2.8	5.1	3.7	-	-	63.5	
50×40	60.5	48.6	3.9	3.7	5.5	5.1	8.7	7.1	76.2	
50×32	60.5	42.7	3.9	3.6	5.5	4.9	-	-	76.2	
50×25	60.5	34.0	3.9	3.4	5.5	4.5	-	-	76.2	
50×20	60.5	27.2	3.9	2.9	5.5	3.9	-	-	76.2	
65×50	76.3	60.5	5.2	3.9	7.0	5.5	9.5	8.7	88.9	
65×40	76.3	48.6	5.2	3.7	7.0	5.1	9.5	7.1	88.9	
65×32	76.3	42.7	5.2	3.6	7.0	4.9	-	-	88.9	
65×25	76.3	34.0	5.2	3.4	7.0	4.5	-	-	88.9	
80×65	89.1	76.3	5.5	5.2	7.6	7.0	11.1	9.5	88.9	
80×50	89.1	60.5	5.5	3.9	7.6	5.5	11.1	8.7	88.9	
80×40	89.1	48.6	5.5	3.7	7.6	5.1	11.1	7.1	88.9	
80×32	89.1	42.7	5.5	3.6	7.6	4.9	-	-	88.9	
90×80	101.6	89.1	5.7	5.5	8.1	7.6	12.7	11.1	101.6	
90×65	101.6	76.3	5.7	5.2	8.1	7.0	12.7	9.5	101.6	
90×50	101.6	60.5	5.7	3.9	8.1	5.5	12.7	8.7	101.6	
90×40	101.6	48.6	5.7	3.7	8.1	5.1	12.7	7.1	101.6	
90×32	101.6	42.7	5.7	3.6	8.1	4.9	-	-	101.6	
100×90	114.3	101.6	6.0	5.7	8.6	8.1	13.5	12.7	101.6	
100×80	114.3	89.1	6.0	5.5	8.6	7.6	13.5	11.1	101.6	
100×65	114.3	76.3	6.0	5.2	8.6	7.0	13.5	9.5	101.6	
100×50	114.3	60.5	6.0	3.9	8.6	5.5	13.5	8.7	101.6	
100×40	114.3	48.6	6.0	3.7	8.6	5.1	13.5	7.1	101.6	

# STEEL BUTT-WELDING PIPE FITTINGS

KS | JIS

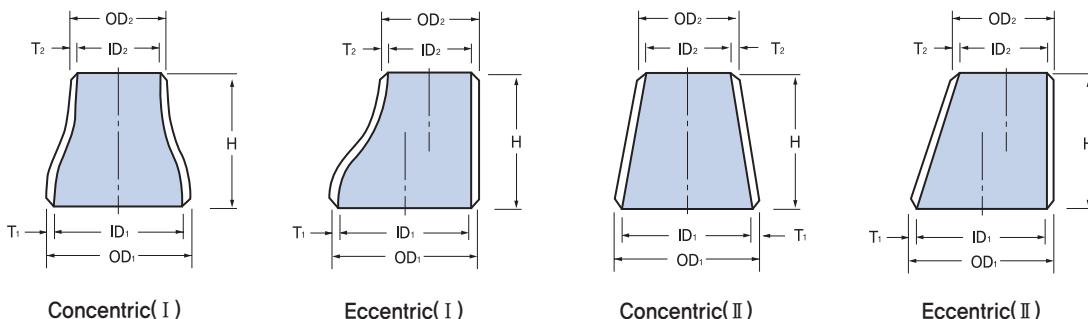
## • Reducer

Sch40, Sch80, Sch120, Sch 160

KS B 1541/43, JIS B 2312/13

Unit : mm

Nominal Pipe Size	Outside Diameter		Wall Thickness T								End to End H
			Sch 40		Sch 80		Sch 120		Sch 160		
	OD <sub>1</sub>	OD <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	
125×100	139.8	114.3	6.6	6.0	9.5	8.6	12.7	11.1	15.9	13.5	127.0
125× 90	139.8	101.6	6.6	5.7	9.5	8.1	-	-	15.9	12.7	127.0
125× 80	139.8	89.1	6.6	5.5	9.5	7.6	-	-	15.9	11.1	127.0
125× 65	139.8	76.3	6.6	5.2	9.5	7.0	-	-	15.9	9.5	127.0
125× 50	139.8	60.5	6.6	3.9	9.5	5.5	-	-	15.9	8.7	127.0
150×125	165.2	139.8	7.1	6.6	11.1	9.5	14.3	12.7	18.2	15.9	139.7
150×100	165.2	114.3	7.1	6.0	11.1	8.6	14.3	11.1	18.2	13.5	139.7
150× 90	165.2	101.6	7.1	5.7	11.1	8.1	-	-	18.2	12.7	139.7
150× 80	165.2	89.1	7.1	5.5	11.1	7.6	-	-	18.2	11.1	139.7
150× 65	165.2	76.3	7.1	5.2	11.1	7.0	-	-	18.2	9.5	139.7
200×150	216.3	165.2	8.2	7.1	12.7	11.0	18.2	14.3	23.0	18.2	152.4
200×125	216.3	139.8	8.2	6.6	12.7	9.5	18.2	12.7	23.0	15.9	152.4
200×100	216.3	114.3	8.2	6.0	12.7	8.6	18.2	11.1	23.0	13.5	152.4
200× 90	216.3	101.6	8.2	5.7	12.7	8.1	-	-	23.0	12.7	152.4
250×200	267.4	216.3	9.3	8.2	15.1	12.7	21.4	18.2	28.6	23.0	177.8
250×150	267.4	165.2	9.3	7.1	15.1	11.0	21.4	14.3	28.6	18.2	177.8
250×125	267.4	139.8	9.3	6.6	15.1	9.5	21.4	12.7	28.6	15.9	177.8
250×100	267.4	114.3	9.3	6.0	15.1	8.6	-	-	28.6	13.5	177.8
300×250	318.5	267.4	10.3	9.3	17.4	15.1	25.4	21.4	33.3	28.6	203.2
300×200	318.5	216.3	10.3	8.2	17.4	12.7	25.4	18.2	33.3	23.0	203.2
300×150	318.5	165.2	10.3	7.1	17.4	11.0	25.4	14.3	33.3	18.2	203.2
300×125	318.5	139.8	10.3	6.6	17.4	9.5	25.4	12.7	33.3	15.9	203.3
350×300	355.6	318.5	11.1	10.3	19.0	17.4	27.8	25.4	35.7	33.3	330.2
350×250	355.6	267.4	11.1	9.3	19.0	15.1	27.8	21.4	35.7	28.6	330.2
350×200	355.6	216.3	11.1	8.2	19.0	12.7	27.8	18.2	35.7	23.0	330.2
350×150	355.6	165.2	11.1	7.1	19.0	11.0	27.8	14.3	35.7	18.2	330.2
400×350	406.4	355.6	12.7	11.1	21.4	19.0	30.9	27.8	40.5	35.7	355.6
400×300	406.4	318.5	12.7	10.3	21.4	17.4	30.9	25.4	40.5	33.3	355.6
400×250	406.4	267.4	12.7	9.3	21.4	15.1	30.9	21.4	40.5	28.6	355.6
400×200	406.4	216.3	12.7	8.2	21.4	12.7	30.9	18.2	40.5	23.0	355.6
450×400	457.2	406.4	14.3	12.7	23.8	21.4	34.9	30.9	45.2	40.5	381.0
450×350	457.2	355.6	14.3	11.1	23.8	19.0	34.9	27.8	45.2	35.7	381.0
450×300	457.2	318.5	14.3	10.3	23.8	17.4	34.9	25.4	45.2	33.3	381.0
450×250	457.2	267.4	14.3	9.3	23.8	15.1	34.9	21.4	45.2	28.6	381.0
500×450	508.0	457.2	15.1	14.3	26.2	23.8	38.1	34.9	50.0	54.2	508.0
500×400	508.0	406.4	15.1	12.7	26.2	21.4	38.1	30.9	50.0	40.5	508.0
500×350	508.0	355.6	15.1	11.1	26.2	19.0	38.1	27.8	50.0	35.7	508.0
500×300	508.0	318.5	15.1	10.3	26.2	17.4	38.1	25.4	50.0	33.3	508.0



KS B 1541/43, JIS B 2312/13

Unit : mm

Nominal Pipe Size	Outside Diameter		Wall Thickness T								End to End H
			Sch 40		Sch 80		Sch 120		Sch 160		
	OD <sub>1</sub>	OD <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	
550×500	558.8	508.0	15.1	15.1	28.6	26.2	-	-	-	-	508.0
550×450	558.8	457.2	15.1	14.3	28.6	23.8	-	-	-	-	508.0
550×400	558.8	406.4	15.1	12.7	28.6	21.4	-	-	-	-	508.0
550×350	558.8	355.6	15.1	11.1	28.6	19.0	-	-	-	-	508.0
600×550	609.6	558.8	17.4	15.1	31.0	28.6	-	-	-	-	508.0
600×500	609.6	508.0	17.4	15.1	31.0	26.2	-	-	-	-	508.0
600×450	609.6	457.2	17.4	14.3	31.0	23.8	-	-	-	-	508.0
600×400	609.6	406.4	17.4	12.7	31.0	21.4	-	-	-	-	508.0
650×600	660.4	609.6	17.4	17.4	-	-	-	-	-	-	609.6
650×550	660.4	558.8	17.4	15.1	-	-	-	-	-	-	609.6
650×500	660.4	508.0	17.4	15.1	-	-	-	-	-	-	609.6
650×450	660.4	457.2	17.4	14.3	-	-	-	-	-	-	609.6
700×650	711.2	660.4	17.4	17.4	-	-	-	-	-	-	609.6
700×600	711.2	609.6	17.4	17.4	-	-	-	-	-	-	609.6
700×550	711.2	558.8	17.4	15.1	-	-	-	-	-	-	609.6
700×500	711.2	508.0	17.4	15.1	-	-	-	-	-	-	609.6
750×700	762.0	711.2	17.4	17.4	-	-	-	-	-	-	609.6
750×650	762.0	660.4	17.4	17.4	-	-	-	-	-	-	609.6
750×600	762.0	609.6	17.4	17.4	-	-	-	-	-	-	609.6
750×550	762.0	558.8	17.4	15.1	-	-	-	-	-	-	609.6
800×750	812.8	760.0	17.4	17.4	-	-	-	-	-	-	609.6
800×700	812.8	711.2	17.4	17.4	-	-	-	-	-	-	609.6
800×650	812.8	660.4	17.4	17.4	-	-	-	-	-	-	609.6
800×600	812.8	609.6	17.4	17.4	-	-	-	-	-	-	609.6
850×800	863.6	812.8	17.4	17.4	-	-	-	-	-	-	609.6
850×750	863.6	762.0	17.4	17.4	-	-	-	-	-	-	609.6
850×700	863.6	711.2	17.4	17.4	-	-	-	-	-	-	609.6
850×650	863.6	660.4	17.4	17.4	-	-	-	-	-	-	609.6
900×850	914.4	863.6	19.0	17.4	-	-	-	-	-	-	609.6
900×800	914.4	812.8	19.0	17.4	-	-	-	-	-	-	609.6
900×750	914.4	762.0	19.0	17.4	-	-	-	-	-	-	609.6
900×700	914.4	711.2	19.0	17.4	-	-	-	-	-	-	609.6

■ KS / JIS

# STAINLESS STEEL BUTT-WELDING FITTINGS

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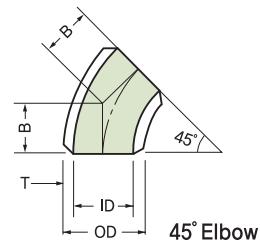
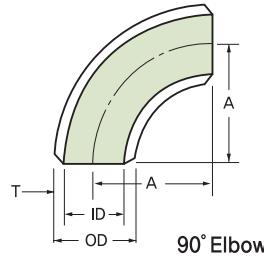
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# STAINLESS STEEL BUTT-WELDING FITTINGS

- 90° Elbow (Long,Short)

- 45° Elbow (Long)

Sch5s, Sch10s, Sch20s



KS B 1541/43, JIS B 2312/13

Unit : mm

Nominal Pipe Size	Outside Diameter OD	Sch 40		Sch 80		Sch 160		Long		Short
		ID	T	ID	T	ID	T	A(90°)	B(45°)	A(90°)
15	21.7	18.4	1.65	17.5	2.1	16.7	2.5	38.1	15.8	-
20	27.2	23.9	1.65	23.0	2.1	22.2	2.5	38.1	15.8	-
25	34.0	30.7	1.65	28.4	2.8	28.0	3.0	38.1	15.8	25.4
32	42.7	39.4	1.65	37.1	2.8	36.7	3.0	47.6	19.7	31.8
40	48.6	45.3	1.65	43.0	2.8	42.6	3.0	57.2	23.7	38.1
50	60.5	57.2	1.65	54.9	2.8	53.5	3.5	76.2	31.6	50.8
65	76.3	72.1	2.10	70.3	3.0	69.3	3.5	95.3	39.5	63.5
80	89.1	84.9	2.10	83.1	3.0	81.1	4.0	114.3	47.3	76.2
90	101.6	97.4	2.10	95.6	3.0	93.6	4.0	133.4	55.3	88.9
100	114.3	110.1	2.10	108.3	3.0	106.3	4.0	152.4	63.1	101.6
125	139.8	134.2	2.80	133.0	3.4	129.8	5.0	190.5	78.9	127.0
150	165.2	159.6	2.80	158.4	3.4	155.2	5.0	228.6	94.7	152.4
200	216.3	210.7	2.80	208.3	4.0	203.3	6.5	304.8	126.3	203.2
250	267.4	260.6	3.40	259.4	4.0	254.4	6.5	381.0	157.8	254.0
300	318.5	310.5	4.00	309.5	4.5	305.5	6.5	457.2	189.4	304.8
350	355.6	347.6	4.00	346.0	4.8	339.8	8.0	533.4	220.9	355.6
400	406.4	398.0	4.20	396.8	4.8	390.6	8.0	609.6	252.5	406.4
450	457.2	448.8	4.20	447.6	4.8	441.4	8.0	685.8	284.1	457.2
500	508.0	498.4	4.80	497.0	5.5	489.0	9.5	762.0	315.6	508.0
550	558.8	549.2	4.80	547.8	5.5	-	-	838.2	347.2	558.8
600	609.6	598.6	5.50	596.8	6.4	-	-	914.4	378.7	609.6
750	762.0	749.2	6.40	746.2	7.9	-	-	1143.0	473.4	762.0

# STAINLESS STEEL BUTT-WELDING FITTINGS

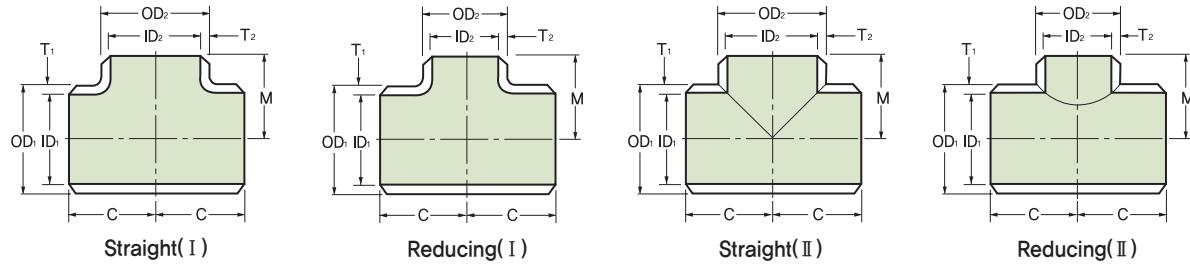
## • Tee

Sch5s, Sch10s, Sch20s

KS B 1541/43, JIS B 2312/13

Unit : mm

Nominal Pipe Size	Outside Diameter		Wall Thickness T						Center to End	
	OD <sub>1</sub>	OD <sub>2</sub>	Sch 5s		Sch 10s		Sch 20s		C	M
			T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>		
15	21.7	21.7	1.65	1.65	2.1	2.1	2.5	2.5	25.4	25.4
20	27.2	27.2	1.65	1.65	2.1	2.1	2.5	2.5	28.6	28.6
25	34.0	34.0	1.65	1.65	2.8	2.8	3.0	3.0	38.1	38.1
32	42.7	42.7	1.65	1.65	2.8	2.8	3.0	3.0	47.6	47.6
32×32×25	42.7	34.0	1.65	1.65	2.8	2.8	3.0	3.0	47.6	47.6
40	48.6	48.6	1.65	1.65	2.8	2.8	3.0	3.0	57.2	57.2
40×40×32	48.6	42.7	1.65	1.65	2.8	2.8	3.0	3.0	57.2	57.2
40×40×25	48.6	34.0	1.65	1.65	2.8	2.8	3.0	3.0	57.2	57.2
50	60.5	60.5	1.65	1.65	2.8	2.8	3.5	3.5	63.5	63.5
50×50×40	60.5	48.6	1.65	1.65	2.8	2.8	3.5	3.0	63.5	60.3
50×50×32	60.5	42.7	1.65	1.65	2.8	2.8	3.5	3.0	63.5	57.2
65	76.3	76.3	2.10	2.10	3.0	3.0	3.5	3.5	76.2	76.2
65×65×50	76.3	60.5	2.10	1.65	3.0	2.8	3.5	3.5	76.2	69.9
65×65×40	76.3	48.6	2.10	1.65	3.0	2.8	3.5	3.0	76.2	66.7
80	89.1	89.1	2.10	2.10	3.0	3.0	4.0	4.0	85.7	85.7
80×80×65	89.1	76.3	2.10	2.10	3.0	3.0	4.0	3.5	85.7	82.6
80×80×50	89.1	60.5	2.10	1.65	3.0	2.8	4.0	3.5	85.7	76.2
90	101.6	101.6	2.10	2.10	3.0	3.0	4.0	4.0	95.3	95.3
90×90×80	101.6	89.1	2.10	2.10	3.0	3.0	4.0	4.0	95.3	92.1
90×90×65	101.6	76.3	2.10	2.10	3.0	3.0	4.0	3.5	95.3	88.9
100	114.3	114.3	2.10	2.10	3.0	3.0	4.0	4.0	104.8	104.8
100×100×90	114.3	101.6	2.10	2.10	3.0	3.0	4.0	4.0	104.8	101.6
100×100×80	114.3	89.1	2.10	2.10	3.0	3.0	4.0	4.0	104.8	98.4
100×100×65	114.3	76.3	2.10	2.10	3.0	3.0	4.0	3.5	104.8	95.3
125	139.8	139.8	2.80	2.80	3.4	3.4	5.0	5.0	123.8	123.8
125×125×100	139.8	114.3	2.80	2.10	3.4	3.0	5.0	4.0	123.8	117.5
125×125×90	139.8	101.6	2.80	2.10	3.4	3.0	5.0	4.0	123.8	114.3
125×125×80	139.8	89.1	2.80	2.10	3.4	3.0	5.0	4.0	123.8	111.1
150	165.2	165.2	2.80	2.80	3.4	3.4	5.0	5.0	142.9	142.9
150×150×125	165.2	139.8	2.80	2.80	3.4	3.4	5.0	5.0	142.9	136.5
150×150×100	165.2	114.3	2.80	2.10	3.4	3.0	5.0	4.0	142.9	130.2
200	216.3	216.3	2.80	2.80	4.0	4.0	6.5	6.5	177.8	177.8
200×200×150	216.3	165.2	2.80	2.80	4.0	3.4	6.5	5.0	177.8	168.3
200×200×125	216.3	139.8	2.80	2.80	4.0	3.4	6.5	5.0	177.8	161.9
250	267.4	267.4	3.40	3.40	4.0	4.0	6.5	6.5	215.9	215.9
250×250×200	267.4	216.3	3.40	2.80	4.0	4.0	6.5	6.5	215.9	203.2
250×250×150	267.4	165.2	3.40	2.80	4.0	3.4	6.5	5.0	215.9	193.7
300	318.5	318.5	4.00	4.00	4.5	4.5	6.5	6.5	254.0	254.0
300×300×250	318.5	267.4	4.00	3.40	4.5	4.0	6.5	6.5	254.0	241.3
300×300×200	318.5	216.3	4.00	2.80	4.5	4.0	6.5	6.5	254.0	228.6



KS B 1541/43, JIS B 2312/13

Unit : mm

Nominal Pipe Size	Outside Diameter		Wall Thickness T						Center to End	
	OD <sub>1</sub>	OD <sub>2</sub>	Sch 5s		Sch 10s		Sch 20s			
			T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	C	M
350	355.6	355.6	4.0	4.0	4.8	4.8	8.0	8.0	279.4	279.4
350×350×300	355.6	318.5	4.0	4.0	4.8	4.5	8.0	6.5	279.4	269.9
350×350×250	355.6	267.4	4.0	3.4	4.8	4.0	8.0	6.5	279.4	257.2
350×350×200	355.6	216.3	4.0	2.8	4.8	4.0	8.0	6.5	279.4	247.7
400	406.4	406.4	4.2	4.2	4.8	4.8	8.0	8.0	304.8	304.8
400×400×350	406.4	355.6	4.2	4.0	4.8	4.8	8.0	8.0	304.8	304.8
400×400×300	406.4	318.5	4.2	4.0	4.8	4.5	8.0	6.5	304.8	295.3
400×400×250	406.4	267.4	4.2	3.4	4.8	4.0	8.0	6.5	304.8	282.6
450	457.2	457.2	4.2	4.2	4.8	4.8	8.0	8.0	342.9	342.9
450×450×400	457.2	406.4	4.2	4.2	4.8	4.8	8.0	8.0	342.9	330.2
450×450×350	457.2	355.6	4.2	4.0	4.8	4.8	8.0	8.0	342.9	330.2
450×450×300	457.2	318.5	4.2	4.0	4.8	4.5	8.0	6.5	342.9	320.7
500	508.0	508.0	4.8	4.8	5.5	5.5	9.5	9.5	381.0	381.0
500×500×450	508.0	457.2	4.8	4.2	5.5	4.8	9.5	8.0	381.0	368.3
500×500×400	508.0	406.4	4.8	4.2	5.5	4.8	9.5	8.0	381.0	355.6
500×500×350	508.0	355.6	4.8	4.0	5.5	4.8	9.5	8.0	381.0	355.6
550	558.8	558.8	4.8	4.8	5.5	5.5	-	-	419.1	419.1
550×550×500	558.8	508.0	4.8	4.8	5.5	5.5	-	-	419.1	406.4
550×550×450	558.8	457.2	4.8	4.2	5.5	4.8	-	-	419.1	393.7
550×550×400	558.8	406.4	4.8	4.2	5.5	4.8	-	-	419.1	381.0
600	609.6	609.6	5.5	5.5	6.4	6.4	-	-	431.8	431.8
600×600×550	609.6	558.8	5.5	4.8	6.4	5.5	-	-	431.8	431.8
600×600×500	609.6	508.0	5.5	4.8	6.4	5.5	-	-	431.8	431.8
600×600×450	609.6	457.2	5.5	4.2	6.4	4.8	-	-	431.8	419.1
700	762.0	762.0	6.4	6.4	7.9	7.9	-	-	558.8	558.8
700×700×600	762.0	609.6	6.4	5.5	7.9	6.4	-	-	558.8	533.4

# STAINLESS STEEL BUTT-WELDING FITTINGS

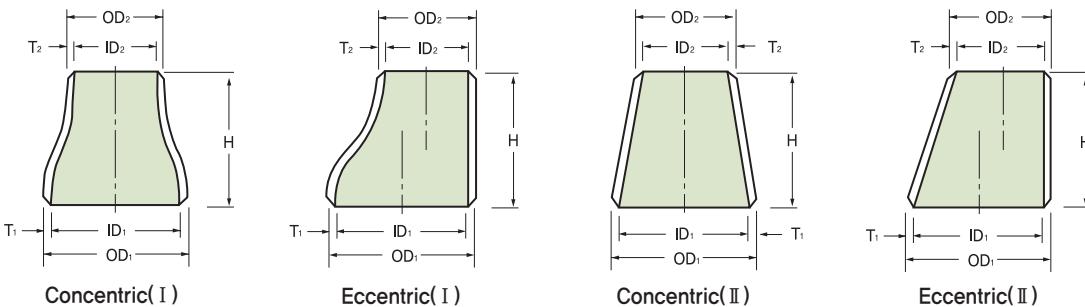
## • Reducer

Sch5s, Sch10s, Sch20s

KS B 1541/43, JIS B 2312/13

Unit : mm

Nominal Pipe Size	Outside Diameter		Wall Thickness T						End to End H	
	OD <sub>1</sub>	OD <sub>2</sub>	Sch 5s		Sch 10s		Sch 20s			
			T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>		
25× 20	34.0	27.2	1.65	1.65	2.8	2.1	3.0	2.5	50.8	
25× 15	34.0	21.7	1.65	1.65	2.8	2.1	2.5	2.5	50.8	
32× 25	42.7	34.0	1.65	1.65	2.8	2.8	3.0	3.0	50.8	
32× 20	42.7	27.2	1.65	1.65	2.8	2.1	3.0	2.5	50.8	
40× 32	48.6	42.7	1.65	1.65	2.8	2.8	3.0	3.0	63.5	
40× 25	48.6	34.0	1.65	1.65	2.8	2.8	3.0	3.0	63.5	
40× 20	48.6	27.2	1.65	1.65	2.8	2.1	3.0	2.5	63.5	
50× 40	60.5	48.6	1.65	1.65	2.8	2.8	3.5	3.0	76.2	
50× 32	60.5	42.7	1.65	1.65	2.8	2.8	3.5	3.0	76.2	
50× 25	60.5	34.0	1.65	1.65	2.8	2.8	3.5	3.0	76.2	
65× 50	76.3	60.5	2.10	1.65	3.0	2.8	3.5	3.5	88.9	
65× 40	76.3	48.6	2.10	1.65	3.0	2.8	3.5	3.0	88.9	
65× 32	76.3	42.7	2.10	1.65	3.0	2.8	3.5	3.0	88.9	
80× 65	89.1	76.3	2.10	2.10	3.0	3.0	4.0	3.5	88.9	
80× 50	89.1	60.5	2.10	1.65	3.0	2.8	4.0	3.5	88.9	
80× 40	89.1	48.6	2.10	1.65	3.0	2.8	4.0	3.0	88.9	
90× 80	101.6	89.1	2.10	2.10	3.0	3.0	4.0	4.0	101.6	
90× 65	101.6	76.3	2.10	2.10	3.0	3.0	4.0	3.5	101.6	
90× 50	101.6	60.5	2.10	1.65	3.0	2.8	4.0	3.5	101.6	
100× 90	114.3	101.6	2.10	2.10	3.0	3.0	4.0	4.0	101.6	
100× 80	114.3	89.1	2.10	2.10	3.0	3.0	4.0	4.0	101.6	
100× 65	114.3	76.3	2.10	2.10	3.0	3.0	4.0	3.5	101.6	
100× 50	114.3	60.5	2.10	1.65	3.0	2.8	4.0	3.5	101.6	
125× 100	139.8	114.3	2.80	2.10	3.4	3.0	5.0	4.0	127.0	
125× 90	139.8	101.6	2.80	2.10	3.4	3.0	5.0	4.0	127.0	
125× 80	139.8	89.1	2.80	2.10	3.4	3.0	5.0	4.0	127.0	
125× 65	139.8	76.3	2.80	2.10	3.4	3.0	5.0	3.5	127.0	
150×125	165.2	139.8	2.80	2.80	3.4	3.4	5.0	5.0	139.7	
150×100	165.2	114.3	2.80	2.10	3.4	3.0	5.0	4.0	139.7	
150× 90	165.2	101.6	2.80	2.10	3.4	3.0	5.0	4.0	139.7	
150× 80	165.2	89.1	2.80	2.10	3.4	3.0	5.0	4.0	139.7	
200×150	216.3	165.2	2.80	2.80	4.0	3.4	6.5	5.0	152.4	
200×125	216.3	139.8	2.80	2.80	4.0	3.4	6.5	5.0	152.4	
200×100	216.3	114.3	2.80	2.10	4.0	3.0	6.5	4.0	152.4	



KS B 1541/43, JIS B 2312/13

Unit : mm

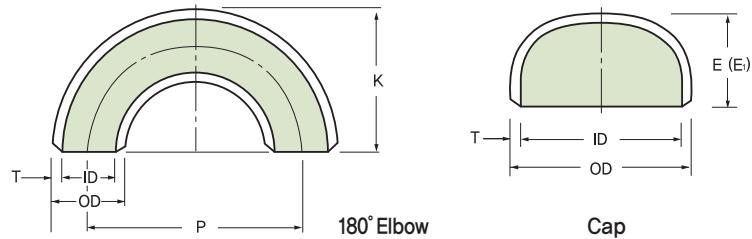
Nominal Pipe Size	Outside Diameter		Wall Thickness T						End to End H	
	OD <sub>1</sub>	OD <sub>2</sub>	Sch 5s		Sch 10s		Sch 20s			
			T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>		
250×200	267.4	216.3	3.4	2.8	4.0	4.0	6.5	6.5	177.8	
250×150	267.4	165.2	3.4	2.8	4.0	3.4	6.5	5.0	177.8	
250×125	267.4	139.8	3.4	2.8	4.0	3.4	6.5	5.0	177.8	
250×100	267.4	114.3	3.4	2.1	4.0	3.0	6.5	4.0	177.8	
300×250	318.5	267.4	4.0	3.4	4.5	4.0	6.5	6.5	203.2	
300×200	318.5	216.3	4.0	2.8	4.5	4.0	6.5	6.5	203.2	
300×150	318.5	165.2	4.0	2.8	4.5	3.4	6.5	5.0	203.2	
300×125	318.5	139.8	4.0	2.8	4.5	3.4	6.5	5.0	203.3	
350×300	355.6	318.5	4.0	4.0	4.8	4.5	8.0	6.5	330.2	
350×250	355.6	267.4	4.0	3.4	4.8	4.0	8.0	6.5	330.2	
350×200	355.6	216.3	4.0	2.8	4.8	4.0	8.0	6.5	330.2	
350×150	355.6	165.2	4.0	2.8	4.8	3.4	8.0	5.0	330.2	
400×350	406.4	355.6	4.2	4.0	4.8	4.8	8.0	8.0	355.6	
400×300	406.4	318.5	4.2	4.0	4.8	4.5	8.0	6.5	355.6	
400×250	406.4	267.4	4.2	3.4	4.8	4.0	8.0	6.5	355.6	
400×200	406.4	216.3	4.2	2.8	4.8	4.0	8.0	6.5	355.6	
450×400	457.2	406.4	4.2	4.2	4.8	4.8	8.0	8.0	381.0	
450×350	457.2	355.6	4.2	4.0	4.8	4.8	8.0	8.0	381.0	
450×300	457.2	318.5	4.2	4.0	4.8	4.5	8.0	6.5	381.0	
450×250	457.2	267.4	4.2	3.4	4.8	4.0	8.0	6.5	381.0	
500×450	508.0	457.2	4.8	4.2	5.5	4.8	9.5	8.0	508.0	
500×400	508.0	406.4	4.8	4.2	5.5	4.8	9.5	8.0	508.0	
500×350	508.0	355.6	4.8	4.0	5.5	4.8	9.5	8.0	508.0	
500×300	508.0	318.5	4.8	4.0	5.5	4.5	9.5	6.5	508.0	
550×500	558.8	508.0	4.8	4.8	5.5	5.5	-	-	508.0	
550×450	558.8	457.2	4.8	4.2	5.5	4.8	-	-	508.0	
550×400	558.8	406.4	4.8	4.2	5.5	4.8	-	-	508.0	
600×550	609.6	508.0	5.5	4.8	6.4	5.5	-	-	508.0	
600×500	609.6	508.0	5.5	4.8	6.4	5.5	-	-	508.0	
600×450	609.6	457.2	5.5	4.2	6.4	4.8	-	-	508.0	
750×600	762.0	609.6	6.4	5.5	7.9	6.4	-	-	609.6	

# STAINLESS STEEL BUTT-WELDING FITTINGS

- **180° Elbow (Long, Short)**

- **Cap**

Sch5s, Sch10s, Sch20s



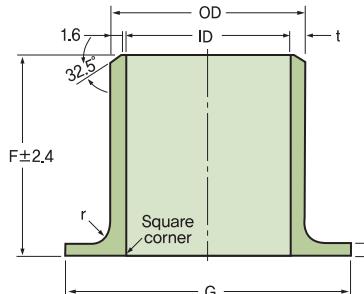
KS B 1541/43, JIS B 2312/13

Unit : mm

Nominal Pipe Size	Outside Diameter OD	Wall Thickness T			Cap			180° Elbow			
		Sch 5s	Sch 10s	Sch 20s	E	E <sub>1</sub>	Limited Wall Thickness For E	P	K	P	K
15	21.7	1.65	2.1	2.5	25.4	-	-	76.2	49.0	-	-
20	27.2	1.65	2.1	2.5	25.4	-	-	76.2	51.7	-	-
25	34.0	1.65	2.8	3.0	38.1	-	-	76.2	55.1	50.8	42.4
32	42.7	1.65	2.8	3.0	38.1	-	-	95.2	69.0	63.6	53.2
40	48.6	1.65	2.8	3.0	38.1	-	-	114.4	81.5	76.2	62.4
50	60.5	1.65	2.8	3.5	38.1	44.5	5.5	152.4	106.5	101.6	81.1
65	76.3	2.10	3.0	3.5	38.1	50.8	7.0	190.6	133.5	127.0	101.7
80	89.1	2.10	3.0	4.0	50.8	63.5	7.6	228.6	158.9	152.4	120.8
90	101.6	2.10	3.0	4.0	63.5	76.2	8.1	266.8	184.2	177.8	139.7
100	114.3	2.10	3.0	4.0	63.5	76.2	8.6	304.8	209.6	203.2	158.8
125	139.8	2.80	3.4	5.0	76.2	88.9	9.5	381.0	260.4	254.0	196.9
150	165.2	2.80	3.4	5.0	88.9	101.6	11.0	457.2	311.2	304.8	235.0
200	216.3	2.80	4.0	6.5	101.6	127.0	12.7	609.6	413.0	406.4	311.4
250	267.4	3.40	4.0	6.5	127.0	152.4	12.7	762.0	514.7	508.0	387.7
300	318.5	4.00	4.5	6.5	152.4	177.8	12.7	914.4	616.5	609.6	464.1
350	355.6	4.00	4.8	8.0	165.1	190.5	12.7	1066.8	711.2	711.2	533.4
400	406.4	4.20	4.8	8.0	177.8	203.2	12.7	1219.2	812.8	812.8	609.6
450	457.2	4.20	4.8	8.0	203.2	228.6	12.7	1371.6	914.4	914.4	685.8
500	508.0	4.80	5.5	9.5	228.6	254.0	12.7	1524.0	1016.0	1016.0	762.0

## • Lap Joint Stub End

Sch5s, Sch10s, Sch20s, Sch40s



JPI-7S-15-70

Unit : mm

Nominal Pipe Size	Outside Diameter OD	Sch 5s		Sch 10s		Sch 20s		Sch 40s		r	G	F
		ID	T	ID	T	ID	T	ID	T			
15	21.7	18.4	1.65	17.5	2.1	16.7	2.5	16.1	2.8	3.2	35	50
20	27.2	23.9	1.65	23.0	2.1	22.2	2.5	21.4	2.9	3.2	43	50
25	34.0	30.7	1.65	28.4	2.8	28.0	3.0	27.2	3.4	3.2	51	50
32	42.7	39.4	1.65	37.1	2.8	36.7	3.0	35.5	3.6	4.8	64	50
40	48.6	45.3	1.65	43.0	2.8	42.6	3.0	41.2	3.7	6.4	73	50
50	60.5	57.2	1.65	54.9	2.8	53.5	3.5	52.7	3.9	7.9	92	65
65	76.3	72.1	2.10	70.3	3.0	69.3	3.5	65.9	5.2	7.9	105	65
80	89.1	84.9	2.10	83.1	3.0	81.1	4.0	78.1	5.5	9.5	127	65
90	101.6	97.4	2.10	95.6	3.0	93.6	4.0	90.2	5.7	9.5	140	75
100	114.3	110.1	2.10	108.3	3.0	106.3	4.0	102.3	6.0	11.1	157	75
125	139.8	134.2	2.80	133.0	3.4	129.8	5.0	126.6	6.6	11.1	186	75
150	165.2	159.6	2.80	158.4	3.4	155.2	5.0	151.0	7.1	12.7	216	90
200	216.3	210.7	2.80	208.3	4.0	203.3	6.5	199.9	8.2	12.7	270	100
250	267.4	260.6	3.40	259.4	4.0	254.4	6.5	248.8	9.3	12.7	324	125
300	318.5	310.5	4.00	309.5	4.5	305.5	6.5	297.9	10.3	12.7	381	150

• Minimum Lap Thickness "T" shall not be less than Wall Thickness "t"

KS/JIS 10K

Unit : mm

Nominal Pipe Size	Outside Diameter OD	Sch 5s		Sch 10s		Sch 20s		Sch 40s		r	G	F
		ID	T	ID	T	ID	T	ID	T			
15	21.7	18.4	1.65	17.5	2.1	16.7	2.5	16.1	2.8	3	51	30
20	27.2	23.9	1.65	23.0	2.1	22.2	2.5	21.4	2.9	3	56	30
25	34.0	30.7	1.65	28.4	2.8	28.0	3.0	27.2	3.4	3	67	50
32	42.7	39.4	1.65	37.1	2.8	36.7	3.0	35.5	3.6	4	76	50
40	48.6	45.3	1.65	43.0	2.8	42.6	3.0	41.2	3.7	4	81	50
50	60.5	57.2	1.65	54.9	2.8	53.5	3.5	52.7	3.9	4	96	50
65	76.3	72.1	2.10	70.3	3.0	69.3	3.5	65.9	5.2	5	116	50
80	89.1	84.9	2.10	83.1	3.0	81.1	4.0	78.1	5.5	5	126	50
90	101.6	97.4	2.10	95.6	3.0	93.6	4.0	90.2	5.7	5	136	50
100	114.3	110.1	2.10	108.3	3.0	106.3	4.0	102.3	6.0	5	151	50
125	139.8	134.2	2.80	133.0	3.4	129.8	5.0	126.6	6.6	6	182	50
150	165.2	159.6	2.80	158.4	3.4	155.2	5.0	151.0	7.1	6	212	50
200	216.3	210.7	2.80	208.3	4.0	203.3	6.5	199.9	8.2	6	262	65
250	267.4	260.6	3.40	259.4	4.0	254.4	6.5	248.8	9.3	6	324	65
300	318.5	310.5	4.00	309.5	4.5	305.5	6.5	297.9	10.3	8	368	65

• This Specification Used For JIS 10k Flanges.

# STEEL & STAINLESS STEEL **ASME** BUTT-WELDING PIPE FITTINGS



■ ASME

# WROUGHT STEEL BUTT-WELDING FITTINGS

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# WROUGHT STEEL BUTT-WELDING FITTING

- 90° Elbow(Long, Short)

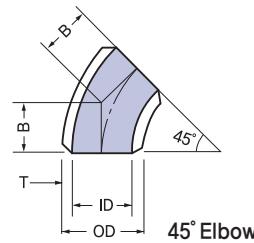
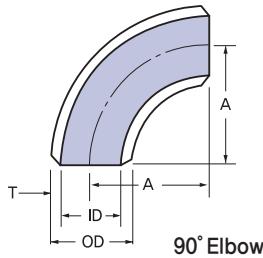
- 45° Elbow(Long)

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

ASME B16.9, ASME B16.28

Unit : mm

Nominal Pipe Size	Outside Diameter O.D	Center-to-End			STD		Sch 40	
		Long		Short	T	I.D	T	I.D
		A	B	A				
½	0.840	1.50	0.62	-	0.109	0.622	0.109	0.622
¾	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 ¼	1.660	1.88	1.00	1.25	0.140	1.380	0.140	1.380
1 ½	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 ½	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 ½	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	0.688	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		



Unit : inch

X-S		Sch80		Sch160		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	0.218	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	3.348	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	1.968	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

# WROUGHT STEEL BUTT-WELDING FITTING

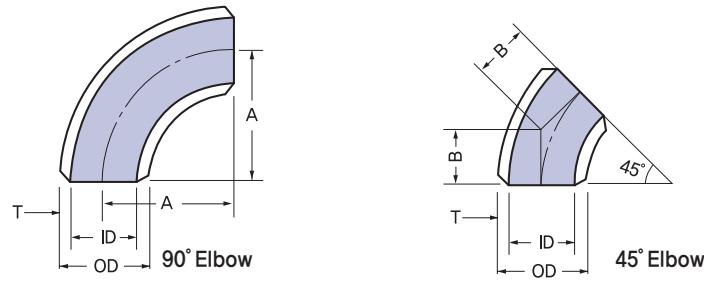
- **90° Elbow (Long, Short)**

- **45° Elbow (Long)**

Sch20, Sch30, Sch60, Sch100  
Sch120, Sch140

ASME B16.9, ASME B16.28

Nominal Pipe Size	Outside Diameter O.D	Center-to-End			Sch 20		Sch 40	
		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	0.375	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	0.500	21.000
24	24.000	36.00	15.00	24.00	0.375	23.250	0.562	22.876
26	26.000	39.00	16.00	26.00	0.500	25.000	-	-
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



Unit : inch

Sch60		Sch100		Sch120		Sch140		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	0.936	12.128	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
0.696	22.062	1.531	20.938	1.812	20.376	2.062	19.876	24
-	-	-	-	-	-	-	-	26
-	-	-	-	-	-	-	-	28
-	-	-	-	-	-	-	-	30
-	-	-	-	-	-	-	-	32
-	-	-	-	-	-	-	-	34
-	-	-	-	-	-	-	-	36

# WROUGHT STEEL BUTT-WELDING FITTING

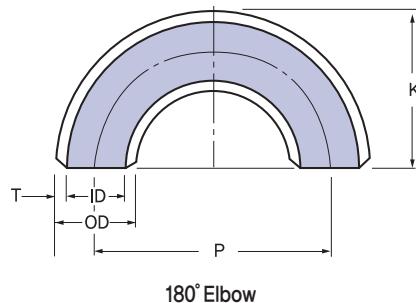
## • 180° Elbow (Long, Short)

STD, Sch40, X-S, Sch80, Sch160, XX-S  
Sch20, Sch30, Sch60, Sch100, Sch120, Sch140

ASME B16.9, ASME B16.28

Nominal Pipe Size	Outside Diameter OD	Long		Short		STD		Sch 40	
		Center to Center O	Back to Face K	Center to Center O	Back to Face K	T	ID	T	ID
1/2	0.840	3.00	1.88	-	-	0.109	0.622	0.109	0.622
3/4	1.050	3.00	2.00	-	-	0.113	0.824	0.113	0.824
1	1.315	3.00	2.19	2.00	1.62	0.133	1.049	0.133	1.049
1 1/4	1.660	3.75	2.75	2.50	2.06	0.140	1.380	0.140	1.380
1 1/2	1.900	4.50	3.25	3.00	2.44	0.145	1.610	0.145	1.610
2	2.375	6.00	4.19	4.00	3.19	0.154	2.067	0.154	2.067
2 1/2	2.875	7.50	5.19	5.00	3.94	0.203	2.469	0.203	2.469
3	3.500	9.00	6.25	6.00	4.75	0.216	3.068	0.216	3.068
3 1/2	4.000	10.50	7.25	7.00	5.50	0.226	3.548	0.226	3.548
4	4.500	12.00	8.25	8.00	6.25	0.237	4.026	0.237	4.026
5	5.563	15.00	10.31	10.00	7.75	0.258	5.047	0.258	5.047
6	6.625	18.00	12.31	12.00	9.31	0.280	6.065	0.280	6.065
8	8.625	24.00	16.31	16.00	12.31	0.322	7.981	0.322	7.981
10	10.750	30.00	20.38	20.00	15.38	0.365	10.020	0.365	10.020
12	12.750	36.00	24.38	24.00	18.38	0.375	12.000	0.406	11.938
14	14.000	42.00	28.00	28.00	21.00	0.375	13.250	0.438	13.124
16	16.000	48.00	32.00	32.00	24.00	0.375	15.250	0.500	15.000
18	18.000	54.00	36.00	36.00	27.00	0.375	17.250	0.562	16.876
20	20.000	60.00	40.00	40.00	30.00	0.375	19.250	0.594	18.812
22	22.000	66.00	44.00	44.00	33.00	0.375	21.250	0.594	20.812
24	24.000	72.00	48.00	48.00	36.00	0.375	23.250	0.688	22.624

Nominal Pipe Size	Outside Diameter OD	Long		Short		Sch 20		Sch 30	
		Center to Center O	Back to Face K	Center to Center O	Back to Face K	T	ID	T	ID
4	4.500	12.00	8.25	8.00	6.25	-	-	-	-
5	5.563	15.00	10.31	10.00	7.75	-	-	-	-
6	6.625	18.00	12.31	12.00	9.31	-	-	-	-
8	8.625	24.00	16.31	16.00	12.31	0.250	8.125	0.277	8.071
10	10.750	30.00	20.38	20.00	15.38	0.250	10.250	0.307	10.136
12	12.750	36.00	24.38	24.00	18.38	0.250	12.250	0.330	12.090
14	14.000	42.00	28.00	28.00	21.00	0.312	13.376	0.375	13.250
16	16.000	48.00	32.00	32.00	24.00	0.312	15.376	0.375	15.250
18	18.000	54.00	36.00	36.00	27.00	0.312	17.376	0.438	17.124
20	20.000	60.00	40.00	40.00	30.00	0.375	19.250	0.500	19.000
22	22.000	66.00	44.00	44.00	33.00	0.375	21.250	0.500	21.000
24	24.000	72.00	48.00	48.00	36.00	0.375	22.250	0.562	22.876



Unit : inch

X-S		Sch80		Sch160		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	0.218	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	3.348	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	1.968	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

Sch 60		Sch100		Sch120		Sch140		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	0.936	12.128	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

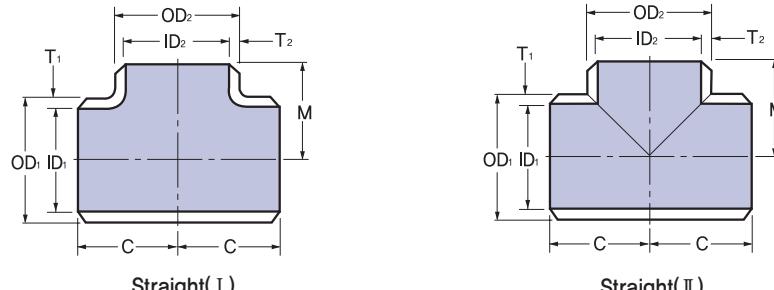
# WROUGHT STEEL BUTT-WELDING FITTING

## • 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	28.00	0.375	41.250	-	-
44	44.000	32.00	30.00	0.375	43.250	-	-
46	46.000	33.50	31.50	0.375	45.250	-	-
48	48.000	35.00	33.00	0.375	47.250	-	-
50	50,000	37.16	35.36	-	-	-	-
52	52,000	38.16	36.36	-	-	-	-
54	54,000	39.16	37.36	-	-	-	-
56	56,000	40.16	38.36	-	-	-	-
58	58,000	41.16	39.36	-	-	-	-
60	60,000	42.16	40.36	-	-	-	-



Unit : inch

X-S		Sch80		Sch160		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	0.218	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	3.348	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
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
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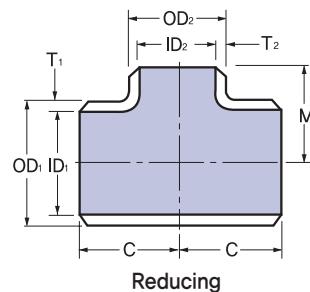
# WROUGHT STEEL BUTT-WELDING FITTING

## • Reducing Tee

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

ASME B16.9

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



Unit : inch

X-S		Sch80		Sch160		XX-S		Nominal Pipe Size
T <sub>1</sub>	T <sub>2</sub>							
0.147	0.126	0.147	0.126	-	-	-	-	1/2 × 1/2 × 3/8
0.147	0.119	0.147	0.119	-	-	-	-	1/2 × 1/2 × 1/4
0.154	0.147	0.154	0.147	0.218	0.188	0.308	0.294	3/4 × 3/4 × 1/2
0.154	0.126	0.154	0.126	-	-	-	-	3/4 × 3/4 × 3/8
0.179	1.540	0.179	0.154	0.250	0.218	0.358	0.308	1 × 1 × 3/4
0.179	0.147	0.179	0.147	0.250	0.188	0.358	0.294	1 × 1 × 1/2
0.191	0.179	0.191	0.179	0.250	0.250	0.382	0.358	1 1/4 × 1 1/4 × 1
0.191	1.540	0.191	0.154	0.250	0.218	0.382	0.308	1 1/4 × 1 1/4 × 3/4
0.191	0.147	0.191	0.147	0.250	0.188	0.382	0.294	1 1/4 × 1 1/4 × 1/2
0.200	0.191	0.200	0.191	0.281	0.250	0.400	0.382	1 1/2 × 1 1/2 × 1 1/4
0.200	0.179	0.200	0.179	0.281	0.250	0.400	0.358	1 1/2 × 1 1/2 × 1
0.200	1.540	0.200	0.154	0.281	0.218	0.400	0.308	1 1/2 × 1 1/2 × 3/4
0.200	0.147	0.200	0.147	0.281	0.188	0.400	0.294	1 1/2 × 1 1/2 × 1/2
0.218	0.200	0.218	0.200	0.344	0.281	0.436	0.400	2 × 2 × 1 1/2
0.218	0.191	0.218	0.191	0.344	0.250	0.436	0.382	2 × 2 × 1 1/4
0.218	0.179	0.218	0.179	0.344	0.250	0.436	0.358	2 × 2 × 1
0.218	0.154	0.218	0.154	0.344	0.218	0.436	0.308	2 × 2 × 3/4
0.276	0.218	0.276	0.218	0.375	0.344	0.552	0.436	2 1/2 × 2 1/2 × 2
0.276	0.200	0.276	0.200	0.375	0.281	0.552	0.400	2 1/2 × 2 1/2 × 1 1/2
0.276	0.191	0.276	0.191	0.375	0.250	0.552	0.382	2 1/2 × 2 1/2 × 1 1/4
0.276	0.179	0.276	0.179	0.375	0.250	0.552	0.358	2 1/2 × 2 1/2 × 1
0.300	0.276	0.300	0.276	0.438	0.375	0.600	0.552	3 × 3 × 2 1/2
0.300	0.218	0.300	0.218	0.438	0.344	0.600	0.436	3 × 3 × 2
0.300	0.200	0.300	0.200	0.438	0.281	0.600	0.400	3 × 3 × 1 1/2
0.300	0.191	0.300	0.191	0.438	0.250	0.600	0.382	3 × 3 × 1 1/4
0.318	0.300	0.318	0.300	-	-	-	-	3 1/2 × 3 1/2 × 3
0.318	0.276	0.318	0.276	-	-	-	-	3 1/2 × 3 1/2 × 2 1/2
0.318	0.218	0.318	0.218	-	-	-	-	3 1/2 × 3 1/2 × 2
0.318	0.200	0.318	0.200	-	-	-	-	3 1/2 × 3 1/2 × 1 1/2
0.337	0.318	0.337	0.318	-	-	-	-	4 × 4 × 3 1/2
0.337	0.300	0.337	0.300	0.531	0.438	0.674	0.600	4 × 4 × 3
0.337	0.276	0.337	0.276	0.531	0.375	0.674	0.552	4 × 4 × 2 1/2
0.337	0.218	0.337	0.218	0.531	0.344	0.674	0.436	4 × 4 × 2
0.337	0.200	0.337	0.200	0.531	0.281	0.674	0.400	4 × 4 × 1 1/2
0.375	0.337	0.375	0.337	0.625	0.531	0.750	0.674	5 × 5 × 4
0.375	0.318	0.375	0.318	-	-	-	-	5 × 5 × 3 1/2
0.375	0.300	0.375	0.300	0.625	0.438	0.750	0.600	5 × 5 × 3
0.375	0.276	0.375	0.276	0.625	0.375	0.750	0.552	5 × 5 × 2 1/2
0.375	0.218	0.375	0.218	0.625	0.344	0.750	0.436	5 × 5 × 2
0.432	0.375	0.432	0.375	0.719	0.625	0.864	0.750	6 × 6 × 5
0.432	0.337	0.432	0.337	0.719	0.531	0.864	0.674	6 × 6 × 4
0.432	0.318	0.432	0.318	-	-	-	-	6 × 6 × 3 1/2
0.432	0.300	0.432	0.300	0.719	0.438	0.864	0.600	6 × 6 × 3
0.432	0.276	0.432	0.276	0.719	0.375	0.864	0.552	6 × 6 × 2 1/2

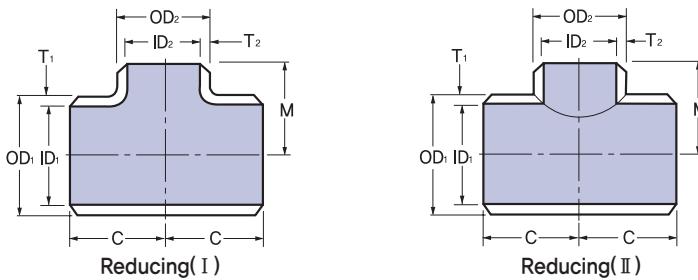
# WROUGHT STEEL BUTT-WELDING FITTING

## • 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 <sub>1</sub>	OD <sub>2</sub>	Run C	Outlet M	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>
8 × 8 × 6	8.625	6.625	7.00	6.62	0.322	0.280	0.322	0.028
8 × 8 × 5	8.625	5.563	7.00	6.38	0.322	0.258	0.322	0.258
8 × 8 × 4	8.625	4.500	7.00	6.12	0.322	0.237	0.322	0.237
8 × 8 × 3 1/2	8.625	4.000	7.00	6.00	0.322	0.226	0.322	0.226
10 × 10 × 8	10.750	8.625	8.50	8.00	0.365	0.322	0.365	0.322
10 × 10 × 6	10.750	6.625	8.50	7.62	0.365	0.280	0.365	0.280
10 × 10 × 5	10.750	5.563	8.50	7.50	0.365	0.258	0.365	0.258
10 × 10 × 4	10.750	4.500	8.50	7.25	0.365	0.237	0.365	0.237
12 × 12 × 10	12.750	10.750	10.00	9.50	0.375	0.365	0.406	0.365
12 × 12 × 8	12.750	8.625	10.00	9.00	0.375	0.322	0.406	0.322
12 × 12 × 6	12.750	6.625	10.00	8.62	0.375	0.280	0.406	0.280
12 × 12 × 5	12.750	5.563	10.00	8.50	0.375	0.258	0.406	0.258
14 × 14 × 12	14.000	12.750	11.00	10.62	0.375	0.375	0.438	0.406
14 × 14 × 10	14.000	10.750	11.00	10.12	0.375	0.365	0.438	0.365
14 × 14 × 8	14.000	8.625	11.00	9.75	0.375	0.322	0.438	0.322
14 × 14 × 6	14.000	6.625	11.00	9.38	0.375	0.280	0.438	0.280
16 × 16 × 14	16.000	14.000	12.00	12.00	0.375	0.375	0.500	0.438
16 × 16 × 12	16.000	12.750	12.00	11.62	0.375	0.375	0.500	0.406
16 × 16 × 10	16.000	10.750	12.00	11.12	0.375	0.365	0.500	0.365
16 × 16 × 8	16.000	8.625	12.00	10.75	0.375	0.322	0.500	0.322
16 × 16 × 6	16.000	6.625	12.00	10.38	0.375	0.280	0.500	0.280
18 × 18 × 16	18.000	16.000	13.50	13.00	0.375	0.375	0.562	0.500
18 × 18 × 14	18.000	14.000	13.50	13.00	0.375	0.375	0.562	0.438
18 × 18 × 12	18.000	12.750	13.50	12.62	0.375	0.375	0.562	0.406
18 × 18 × 10	18.000	10.750	13.50	12.12	0.375	0.365	0.562	0.365
18 × 18 × 8	18.000	8.625	13.50	11.75	0.375	0.322	0.562	0.322
20 × 20 × 18	20.000	18.000	15.00	14.50	0.375	0.375	0.594	0.562
20 × 20 × 16	20.000	16.000	15.00	14.00	0.375	0.375	0.594	0.500
20 × 20 × 14	20.000	14.000	15.00	14.00	0.375	0.375	0.594	0.438
20 × 20 × 12	20.000	12.750	15.00	13.62	0.375	0.375	0.594	0.406
20 × 20 × 10	20.000	10.750	15.00	13.12	0.375	0.365	0.594	0.365
20 × 20 × 8	20.000	8.620	15.00	12.75	0.375	0.322	0.594	0.322
22 × 22 × 20	22.000	20.000	16.50	16.00	0.375	0.375	0.594	0.594
22 × 22 × 18	22.000	18.000	16.50	15.50	0.375	0.375	0.594	0.562
22 × 22 × 16	22.000	16.000	16.50	15.00	0.375	0.375	0.594	0.500
22 × 22 × 14	22.000	14.000	16.50	15.00	0.375	0.375	0.594	0.438
22 × 22 × 12	22.000	12.750	16.50	14.62	0.375	0.375	0.594	0.406
22 × 22 × 10	22.000	10.750	16.50	14.12	0.375	0.365	0.594	0.365
24 × 24 × 22	24.000	22.000	17.00	17.00	0.375	0.375	-	-
24 × 24 × 20	24.000	20.000	17.00	17.00	0.375	0.375	0.688	0.594
24 × 24 × 18	24.000	18.000	17.00	16.50	0.375	0.375	0.688	0.562
24 × 24 × 16	24.000	16.000	17.00	16.00	0.375	0.375	0.688	0.500
24 × 24 × 14	24.000	14.000	17.00	16.00	0.375	0.375	0.688	0.438
24 × 24 × 12	24.000	12.750	17.00	15.62	0.375	0.375	0.688	0.406
24 × 24 × 10	24.000	10.750	17.00	15.12	0.375	0.365	0.688	0.365



Unit : inch

X-S		Sch80		Sch160		XX-S		Nominal Pipe Size
T <sub>1</sub>	T <sub>2</sub>							
0.500	0.432	0.500	0.432	0.906	0.719	0.875	0.864	8 × 8 × 6
0.500	0.375	0.500	0.375	0.906	0.625	0.875	0.750	8 × 8 × 5
0.500	0.318	0.500	0.318	0.906	0.531	0.875	0.674	8 × 8 × 4
0.500	0.300	0.500	0.300	-	-	-	-	8 × 8 × 3 1/2
0.500	0.500	0.594	0.500	1.125	0.906	1.000	0.875	10 × 10 × 8
0.500	0.432	0.594	0.432	1.125	0.719	1.000	0.864	10 × 10 × 6
0.500	0.375	0.594	0.375	1.125	0.625	1.000	0.750	10 × 10 × 5
0.500	0.318	0.594	0.318	1.125	0.531	1.000	0.674	10 × 10 × 4
0.500	0.500	0.688	0.594	1.312	1.125	1.000	1.000	12 × 12 × 10
0.500	0.500	0.688	0.500	1.312	0.906	1.000	0.875	12 × 12 × 8
0.500	0.432	0.688	0.432	1.312	0.719	1.000	0.864	12 × 12 × 6
0.500	0.375	0.688	0.375	1.312	0.625	1.000	0.750	12 × 12 × 5
0.500	0.500	0.750	0.688	1.406	1.312	-	-	14 × 14 × 12
0.500	0.500	0.750	0.594	1.406	1.125	-	-	14 × 14 × 10
0.500	0.500	0.750	0.500	1.406	0.906	-	-	14 × 14 × 8
0.500	0.432	0.750	0.432	1.406	0.719	-	-	14 × 14 × 6
0.500	0.500	0.844	0.750	1.594	1.406	-	-	16 × 16 × 14
0.500	0.500	0.844	0.688	1.594	1.312	-	-	16 × 16 × 12
0.500	0.500	0.844	0.594	1.594	1.125	-	-	16 × 16 × 10
0.500	0.500	0.844	0.500	1.594	0.906	-	-	16 × 16 × 8
0.500	0.432	0.844	0.432	1.594	0.719	-	-	16 × 16 × 6
0.500	0.500	0.938	0.844	1.781	1.594	-	-	18 × 18 × 16
0.500	0.500	0.938	0.750	1.781	1.406	-	-	18 × 18 × 14
0.500	0.500	0.938	0.688	1.781	1.312	-	-	18 × 18 × 12
0.500	0.500	0.938	0.594	1.781	1.125	-	-	18 × 18 × 10
0.500	0.500	0.938	0.500	1.781	0.906	-	-	18 × 18 × 8
0.500	0.500	1.031	0.938	1.969	1.781	-	-	20 × 20 × 18
0.500	0.500	1.031	0.844	1.969	1.594	-	-	20 × 20 × 16
0.500	0.500	1.031	0.750	1.969	1.406	-	-	20 × 20 × 14
0.500	0.500	1.031	0.688	1.969	1.312	-	-	20 × 20 × 12
0.500	0.500	1.031	0.594	1.969	1.125	-	-	20 × 20 × 10
0.500	0.500	1.031	0.500	1.969	0.906	-	-	20 × 20 × 8
0.500	0.500	1.125	1.031	2.125	1.969	-	-	22 × 22 × 20
0.500	0.500	1.125	0.938	2.125	1.781	-	-	22 × 22 × 18
0.500	0.500	1.125	0.844	2.125	1.594	-	-	22 × 22 × 16
0.500	0.500	1.125	0.750	2.125	1.406	-	-	22 × 22 × 14
0.500	0.500	1.125	0.688	2.125	1.312	-	-	22 × 22 × 12
0.500	0.500	1.125	0.594	2.125	1.125	-	-	22 × 22 × 10
0.500	0.500	1.219	1.125	2.344	2.125	-	-	24 × 24 × 22
0.500	0.500	1.219	1.031	2.344	1.969	-	-	24 × 24 × 20
0.500	0.500	1.219	0.938	2.344	1.781	-	-	24 × 24 × 18
0.500	0.500	1.219	0.844	2.344	1.594	-	-	24 × 24 × 16
0.500	0.500	1.219	0.750	2.344	1.406	-	-	24 × 24 × 14
0.500	0.500	1.219	0.688	2.344	1.312	-	-	24 × 24 × 12
0.500	0.500	1.219	0.594	2.344	1.125	-	-	24 × 24 × 10

# WROUGHT STEEL BUTT-WELDING FITTING

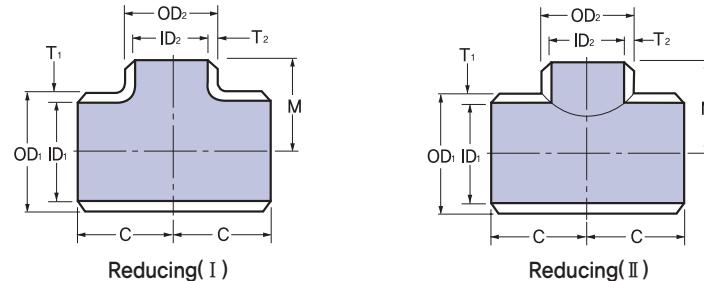
## • Reducing Tee

STD, Sch40, X-S

ASME B16.9

Unit : inch

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



Unit : inch

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

# WROUGHT STEEL BUTT-WELDING FITTING

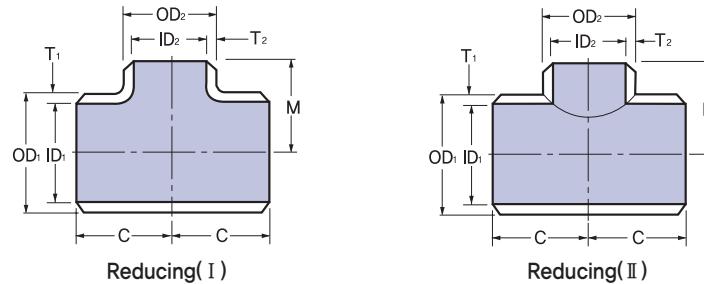
## • Reducing Tee

STD, X-S

ASME B16.9

Unit : inch

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



Unit : inch

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

# WROUGHT STEEL BUTT-WELDING FITTING

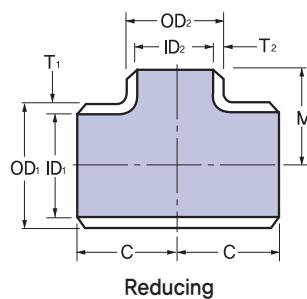
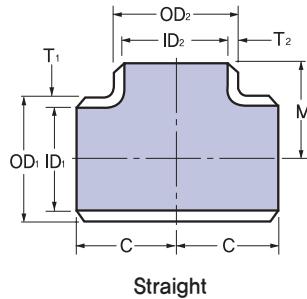
## • Tee

Sch20, Sch30, Sch60, Sch100, Sch120, Sch140

ASME B16.9

Unit : inch

Nominal Pipe Size	Outside Diameter		Center-to-End		Sch20		Sch30	
	OD <sub>1</sub>	OD <sub>2</sub>	Run C	Outlet M	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>
4 × 4 × 4	4.500	4.500	4.12	4.12	-	-	-	-
5 × 5 × 5	5.563	5.563	4.88	4.88	-	-	-	-
5 × 5 × 4	5.563	4.500	4.88	4.62	-	-	-	-
6 × 6 × 6	6.625	6.625	5.62	5.62	-	-	-	-
6 × 6 × 5	6.625	5.563	5.62	5.38	-	-	-	-
6 × 6 × 4	6.625	4.500	5.62	5.12	-	-	-	-
8 × 8 × 8	8.625	8.625	7.00	7.00	0.250	0.250	0.277	0.277
8 × 8 × 6	8.625	6.625	7.00	6.62	-	-	-	-
8 × 8 × 5	8.625	5.563	7.00	6.38	-	-	-	-
8 × 8 × 4	8.625	4.500	7.00	6.12	-	-	-	-
10 × 10 × 10	10.750	10.750	8.50	8.50	0.250	0.250	0.307	0.307
10 × 10 × 8	10.750	8.625	8.50	8.00	0.250	0.250	0.307	0.277
10 × 10 × 6	10.750	6.625	8.50	7.62	-	-	-	-
10 × 10 × 5	10.750	5.563	8.50	7.50	-	-	-	-
10 × 10 × 4	10.750	4.500	8.50	7.25	-	-	-	-
12 × 12 × 12	12.750	12.750	10.00	10.00	0.250	0.250	0.330	0.330
12 × 12 × 10	12.750	10.750	10.00	9.50	0.250	0.250	0.330	0.307
12 × 12 × 8	12.750	8.625	10.00	9.00	0.250	0.250	0.330	0.277
12 × 12 × 6	12.750	6.625	10.00	8.62	-	-	-	-
12 × 12 × 5	12.750	5.563	10.00	8.50	-	-	-	-
14 × 14 × 14	14.000	14.000	11.00	11.00	0.312	0.312	0.375	0.375
14 × 14 × 12	14.000	12.750	11.00	10.62	0.312	0.250	0.375	0.330
14 × 14 × 10	14.000	10.750	11.00	10.12	0.312	0.250	0.375	0.307
14 × 14 × 8	14.000	8.625	11.00	9.75	0.312	0.250	0.375	0.277
14 × 14 × 6	14.000	6.625	11.00	9.38	-	-	-	-
16 × 16 × 16	16.000	16.000	12.00	12.00	0.312	0.312	0.375	0.375
16 × 16 × 14	16.000	14.000	12.00	12.00	0.312	0.312	0.375	0.375
16 × 16 × 12	16.000	12.750	12.00	11.62	0.312	0.250	0.375	0.330
16 × 16 × 10	16.000	10.750	12.00	11.12	0.312	0.250	0.375	0.307
16 × 16 × 8	16.000	8.625	12.00	10.75	0.312	0.250	0.375	0.277
16 × 16 × 6	16.000	6.625	12.00	10.38	-	-	-	-



								Unit : inch
Sch60		Sch100		Sch120		Sch140		Nominal Pipe Size
T <sub>1</sub>	T <sub>2</sub>							
-	-	-	-	0.438	0.438	-	-	4 × 4 × 4
-	-	-	-	0.500	0.500	-	-	5 × 5 × 5
-	-	-	-	0.500	0.438	-	-	5 × 5 × 4
-	-	-	-	0.562	0.562	-	-	6 × 6 × 6
-	-	-	-	0.562	0.500	-	-	6 × 6 × 5
-	-	-	-	0.562	0.438	-	-	6 × 6 × 4
0.406	0.406	0.594	0.594	0.719	0.719	0.812	0.812	8 × 8 × 8
-	-	-	-	0.719	0.562	-	-	8 × 8 × 6
-	-	-	-	0.719	0.500	-	-	8 × 8 × 5
-	-	-	-	0.719	0.438	-	-	8 × 8 × 4
0.500	0.500	0.719	0.719	0.844	0.844	1.000	1.000	10 × 10 × 10
0.500	0.406	0.719	0.594	0.844	0.719	1.000	0.812	10 × 10 × 8
-	-	-	-	0.844	0.562	-	-	10 × 10 × 6
-	-	-	-	0.844	0.500	-	-	10 × 10 × 5
-	-	-	-	0.844	0.438	-	-	10 × 10 × 4
0.562	0.562	0.844	0.844	1.000	1.000	1.125	1.125	12 × 12 × 12
0.562	0.500	0.844	0.719	1.000	0.844	1.125	1.000	12 × 12 × 10
0.562	0.406	0.844	0.594	1.000	0.719	1.125	0.812	12 × 12 × 8
-	-	-	-	1.000	0.562	-	-	12 × 12 × 6
-	-	-	-	1.000	0.500	-	-	12 × 12 × 5
0.594	0.594	0.936	0.936	1.094	1.094	1.250	1.250	14 × 14 × 14
0.594	0.562	0.936	0.844	1.094	1.000	1.250	1.125	14 × 14 × 12
0.594	0.500	0.936	0.719	1.094	0.844	1.250	1.000	14 × 14 × 10
0.594	0.406	0.936	0.594	1.094	0.719	1.250	0.812	14 × 14 × 8
-	-	-	-	1.094	0.562	-	-	14 × 14 × 6
0.656	0.656	1.031	1.031	1.219	1.219	1.438	1.438	16 × 16 × 16
0.656	0.594	1.031	0.936	1.219	1.094	1.438	1.250	16 × 16 × 14
0.656	0.562	1.031	0.844	1.219	1.000	1.438	1.125	16 × 16 × 12
0.656	0.500	1.031	0.719	1.219	0.844	1.438	1.000	16 × 16 × 10
0.656	0.406	1.031	0.594	1.219	0.719	1.438	0.812	16 × 16 × 8
-	-	-	-	1.219	0.562	-	-	16 × 16 × 6

# WROUGHT STEEL BUTT-WELDING FITTING

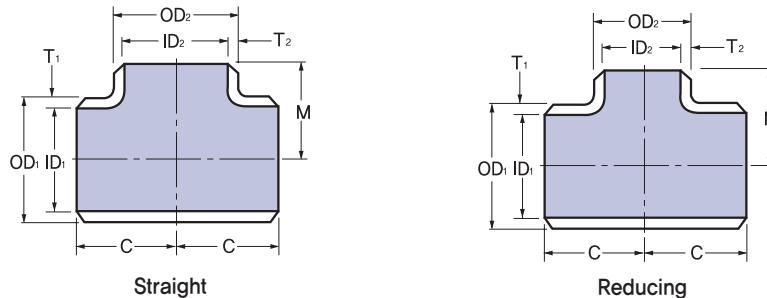
## • Tee

Sch20, Sch30, Sch60, Sch100, Sch120, Sch140

ASME B16.9

Unit : inch

Nominal Pipe Size	Outside Diameter		Center to End		Sch20		Sch30	
	OD <sub>1</sub>	OD <sub>2</sub>	Run C	Outlet M	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>
18 × 18 × 18	18.000	18.000	13.50	13.50	0.312	0.312	0.438	0.438
18 × 18 × 16	18.000	16.000	13.50	13.00	0.312	0.312	0.438	0.375
18 × 18 × 14	18.000	14.000	13.50	13.00	0.312	0.312	0.438	0.375
18 × 18 × 12	18.000	12.750	13.50	12.62	0.312	0.250	0.438	0.330
18 × 18 × 10	18.000	10.750	13.50	12.12	0.312	0.250	0.438	0.307
18 × 18 × 8	18.000	8.620	13.50	11.75	0.312	0.250	0.438	0.277
20 × 20 × 20	20.000	20.000	15.00	15.00	0.375	0.375	0.500	0.500
20 × 20 × 18	20.000	18.000	15.00	14.50	0.375	0.312	0.500	0.438
20 × 20 × 16	20.000	16.000	15.00	14.00	0.375	0.312	0.500	0.375
20 × 20 × 14	20.000	14.000	15.00	14.00	0.375	0.312	0.500	0.375
20 × 20 × 12	20.000	12.750	15.00	13.62	0.375	0.250	0.500	0.330
20 × 20 × 10	20.000	10.750	15.00	13.12	0.375	0.250	0.500	0.307
20 × 20 × 8	20.000	8.620	15.00	12.75	0.375	0.250	0.500	0.277
22 × 22 × 22	22.000	22.000	16.50	16.50	0.375	0.375	0.500	0.500
22 × 22 × 20	22.000	20.000	16.50	16.00	0.375	0.375	0.500	0.500
22 × 22 × 18	22.000	18.000	16.50	15.50	0.375	0.312	0.500	0.438
22 × 22 × 16	22.000	16.000	16.50	15.00	0.375	0.312	0.500	0.375
22 × 22 × 14	22.000	14.000	16.50	15.00	0.375	0.312	0.500	0.375
22 × 22 × 12	22.000	12.750	16.50	14.62	0.375	0.250	0.500	0.330
22 × 22 × 10	22.000	10.750	16.50	14.12	0.375	0.250	0.500	0.307
24 × 24 × 24	24.000	24.000	17.00	17.00	0.375	0.375	0.562	0.562
24 × 24 × 22	24.000	22.000	17.00	17.00	0.375	0.375	0.562	0.500
24 × 24 × 20	24.000	20.000	17.00	17.00	0.375	0.375	0.562	0.500
24 × 24 × 18	24.000	18.000	17.00	16.50	0.375	0.312	0.562	0.438
24 × 24 × 16	24.000	16.000	17.00	16.00	0.375	0.312	0.562	0.375
24 × 24 × 14	24.000	14.000	17.00	16.00	0.375	0.312	0.562	0.375
24 × 24 × 12	24.000	12.750	17.00	15.62	0.375	0.250	0.562	0.330
24 × 24 × 10	24.000	10.750	17.00	15.12	0.375	0.250	0.562	0.307
26 × 26 × 26	26.000	26.000	19.50	19.50	0.500	0.500	-	-
26 × 26 × 24	26.000	24.000	19.50	19.00	0.500	0.375	-	-
26 × 26 × 22	26.000	22.000	19.50	18.50	0.500	0.375	-	-
26 × 26 × 20	26.000	20.000	19.50	18.00	0.500	0.375	-	-
26 × 26 × 18	26.000	18.000	19.50	17.50	0.500	0.312	-	-
26 × 26 × 16	26.000	16.000	19.50	17.00	0.500	0.312	-	-
26 × 26 × 14	26.000	14.000	19.50	17.00	0.500	0.312	-	-
26 × 26 × 12	26.000	12.750	19.50	16.62	0.500	0.250	-	-



Unit : inch

Sch60		Sch100		Sch120		Sch140		Nominal Pipe Size
T <sub>1</sub>	T <sub>2</sub>							
0.750	0.750	1.156	1.156	1.375	1.375	1.562	1.562	18 × 18 × 18
0.750	0.656	1.156	1.031	1.375	1.219	1.562	1.438	18 × 18 × 16
0.750	0.594	1.156	0.938	1.375	1.094	1.562	1.250	18 × 18 × 14
0.750	0.562	1.156	0.844	1.375	1.000	1.562	1.125	18 × 18 × 12
0.750	0.500	1.156	0.719	1.375	0.844	1.562	1.000	18 × 18 × 10
0.750	0.406	1.156	0.594	1.375	0.719	1.562	0.812	18 × 18 × 8
0.812	0.812	1.281	1.281	1.500	1.500	1.750	1.750	20 × 20 × 20
0.812	0.750	1.281	1.156	1.500	1.375	1.750	1.562	20 × 20 × 18
0.812	0.656	1.281	1.031	1.500	1.219	1.750	1.438	20 × 20 × 16
0.812	0.594	1.281	0.938	1.500	1.094	1.750	1.250	20 × 20 × 14
0.812	0.562	1.281	0.844	1.500	1.000	1.750	1.125	20 × 20 × 12
0.812	0.500	1.281	0.719	1.500	0.844	1.750	1.000	20 × 20 × 10
0.812	0.406	1.281	0.594	1.500	0.719	1.750	0.812	20 × 20 × 8
0.875	0.875	1.375	1.375	1.625	1.625	1.875	1.875	22 × 22 × 22
0.875	0.812	1.375	1.281	1.625	1.500	1.875	1.750	22 × 22 × 20
0.875	0.750	1.375	1.156	1.625	1.375	1.875	1.562	22 × 22 × 18
0.875	0.656	1.375	1.031	1.625	1.219	1.875	1.438	22 × 22 × 16
0.875	0.594	1.375	0.938	1.625	1.094	1.875	1.250	22 × 22 × 14
0.875	0.562	1.375	0.844	1.625	1.000	1.875	1.125	22 × 22 × 12
0.875	0.500	1.375	0.719	1.625	0.844	1.875	1.000	22 × 22 × 10
0.969	0.969	1.531	1.531	1.812	1.812	2.062	2.062	24 × 24 × 24
0.969	0.875	1.531	1.375	1.812	1.625	2.062	1.875	24 × 24 × 22
0.969	0.812	1.531	1.281	1.812	1.500	2.062	1.750	24 × 24 × 20
0.969	0.750	1.531	1.156	1.812	1.375	2.062	1.562	24 × 24 × 18
0.969	0.656	1.531	1.031	1.812	1.219	2.062	1.438	24 × 24 × 16
0.969	0.594	1.531	0.938	1.812	1.094	2.062	1.250	24 × 24 × 14
0.969	0.562	1.531	0.844	1.812	1.000	2.062	1.125	24 × 24 × 12
0.969	0.500	1.531	0.719	1.812	0.844	2.062	1.000	24 × 24 × 10
-	-	-	-	-	-	-	-	26 × 26 × 26
-	-	-	-	-	-	-	-	26 × 26 × 24
-	-	-	-	-	-	-	-	26 × 26 × 22
-	-	-	-	-	-	-	-	26 × 26 × 20
-	-	-	-	-	-	-	-	26 × 26 × 18
-	-	-	-	-	-	-	-	26 × 26 × 16
-	-	-	-	-	-	-	-	26 × 26 × 14
-	-	-	-	-	-	-	-	26 × 26 × 12

# WROUGHT STEEL BUTT-WELDING FITTING

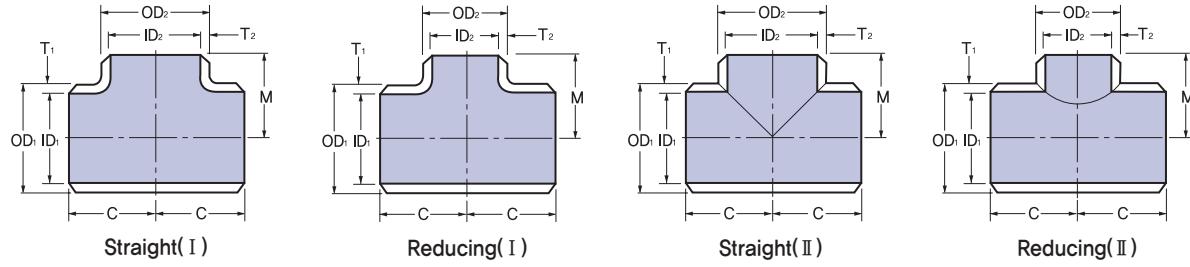
## • Tee

Sch20, Sch30

ASME B16.9

Unit : inch

Nominal Pipe Size	Outside Diameter		Center to End		Sch20		Sch30	
	OD <sub>1</sub>	OD <sub>2</sub>	Run C	Outlet M	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>
28×28×28	28.000	28.000	20.50	20.50	0.500	0.500	0.625	0.625
28×28×26	28.000	26.000	20.50	20.50	0.500	0.500	-	-
28×28×24	28.000	24.000	20.50	20.00	0.500	0.375	0.625	0.562
28×28×22	28.000	22.000	20.50	19.50	0.500	0.375	0.625	0.500
28×28×20	28.000	20.000	20.50	19.00	0.500	0.375	0.625	0.500
28×28×18	28.000	18.000	20.50	18.50	0.500	0.312	0.625	0.438
28×28×16	28.000	16.000	20.50	18.00	0.500	0.312	0.625	0.375
28×28×14	28.000	14.000	20.50	18.00	0.500	0.312	0.625	0.375
28×28×12	28.000	12.750	20.50	17.62	0.500	0.250	0.625	0.330
30×30×30	30.000	30.000	22.00	22.00	0.500	0.500	0.625	0.625
30×30×28	30.000	28.000	22.00	21.50	0.500	0.500	0.625	0.625
30×30×26	30.000	26.000	22.00	21.50	0.500	0.500	-	-
30×30×24	30.000	24.000	22.00	21.00	0.500	0.375	0.625	0.562
30×30×22	30.000	22.000	22.00	20.50	0.500	0.375	0.625	0.500
30×30×20	30.000	20.000	22.00	20.00	0.500	0.375	0.625	0.500
30×30×18	30.000	18.000	22.00	19.50	0.500	0.312	0.625	0.438
30×30×16	30.000	16.000	22.00	19.00	0.500	0.312	0.625	0.375
30×30×14	30.000	14.000	22.00	19.00	0.500	0.312	0.625	0.375
30×30×12	30.000	12.750	22.00	18.62	0.500	0.250	0.625	0.330
30×30×10	30.000	10.750	22.00	18.12	0.500	0.250	0.625	0.307
32×32×32	32.000	32.000	23.50	23.50	0.500	0.500	0.625	0.625
32×32×30	32.000	30.000	23.50	23.00	0.500	0.500	0.625	0.625
32×32×28	32.000	28.000	23.50	22.50	0.500	0.500	0.625	0.625
32×32×26	32.000	26.000	23.50	22.50	0.500	0.500	-	-
32×32×24	32.000	24.000	23.50	22.00	0.500	0.375	0.625	0.562
32×32×22	32.000	22.000	23.50	21.50	0.500	0.375	0.625	0.500
32×32×20	32.000	20.000	23.50	21.00	0.500	0.375	0.625	0.500
32×32×18	32.000	18.000	23.50	20.50	0.500	0.312	0.625	0.438
32×32×16	32.000	16.000	23.50	20.00	0.500	0.312	0.625	0.375
32×32×14	32.000	14.000	23.50	20.00	0.500	0.312	0.625	0.375



ASME B16.9

Unit : inch

Nominal Pipe Size	Outside Diameter		Center to End		Sch20		Sch20	
	OD <sub>1</sub>	OD <sub>2</sub>	Run C	Outlet M	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>
34×34×34	34.000	34.000	25.00	25.00	0.500	0.500	0.625	0.625
34×34×32	34.000	32.000	25.00	24.50	0.500	0.500	0.625	0.625
34×34×30	34.000	30.000	25.00	24.00	0.500	0.500	0.625	0.625
34×34×28	34.000	28.000	25.00	23.50	0.500	0.500	0.625	0.625
34×34×26	34.000	26.000	25.00	23.50	0.500	0.500	-	-
34×34×24	34.000	24.000	25.00	23.00	0.500	0.375	0.625	0.562
34×34×22	34.000	22.000	25.00	22.50	0.500	0.375	0.625	0.500
34×34×20	34.000	20.000	25.00	22.00	0.500	0.375	0.625	0.500
34×34×18	34.000	18.000	25.00	21.50	0.500	0.312	0.625	0.438
34×34×16	34.000	16.000	25.00	21.00	0.500	0.312	0.625	0.375
36×36×36	36.000	36.000	26.50	26.50	0.500	0.500	0.625	0.625
36×36×34	36.000	34.000	26.50	26.00	0.500	0.500	0.625	0.625
36×36×32	36.000	32.000	26.50	25.50	0.500	0.500	0.625	0.625
36×36×30	36.000	30.000	26.50	25.00	0.500	0.500	0.625	0.625
36×36×28	36.000	28.000	26.50	24.50	0.500	0.500	0.625	0.625
36×36×26	36.000	26.000	26.50	24.50	0.500	0.500	-	-
36×36×24	36.000	24.000	26.50	24.00	0.500	0.375	0.625	0.562
36×36×22	36.000	22.000	26.50	23.50	0.500	0.375	0.625	0.500
36×36×20	36.000	20.000	26.50	23.00	0.500	0.375	0.625	0.500
36×36×18	36.000	18.000	26.50	22.50	0.500	0.312	0.625	0.438
36×36×16	36.000	16.000	26.50	22.00	0.500	0.312	0.625	0.375

# WROUGHT STEEL BUTT-WELDING FITTING

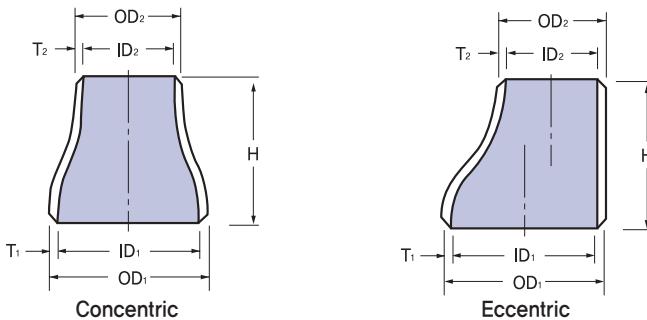
## • Reducer

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

ASME B16.9

Unit : inch

Nominal Pipe Size	Outside Diameter		Center to End	Sch20		Sch30	
	OD <sub>1</sub>	OD <sub>2</sub>		T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>
3/4 × 1/2	1.050	0.840	1.50	0.113	0.109	0.113	0.109
3/4 × 3/8	1.050	0.675	1.50	0.113	0.091	0.113	0.091
1 × 3/4	1.315	1.050	2.00	0.133	0.113	0.133	0.113
1 × 1/2	1.315	0.840	2.00	0.133	0.109	0.133	0.109
1 1/4 × 1	1.660	1.315	2.00	0.140	0.133	0.140	0.133
1 1/4 × 3/4	1.660	1.050	2.00	0.140	0.113	0.140	0.113
1 1/4 × 1/2	1.660	0.840	2.00	0.140	0.109	0.140	0.109
1 1/2 × 1 1/4	1.900	1.660	2.50	0.145	0.140	0.145	0.140
1 1/2 × 1	1.900	1.315	2.50	0.145	0.133	0.145	0.133
1 1/2 × 3/4	1.900	1.050	2.50	0.145	0.113	0.145	0.113
1 1/2 × 1/2	1.900	0.840	2.50	0.145	0.109	0.145	0.109
2 × 1 1/2	2.375	1.900	3.00	0.154	0.145	0.154	0.145
2 × 1 1/4	2.375	1.660	3.00	0.154	0.140	0.154	0.140
2 × 1	2.375	1.315	3.00	0.154	0.133	0.154	0.133
2 × 3/4	2.375	1.050	3.00	0.154	0.113	0.154	0.113
2 1/2 × 2	2.875	2.375	3.50	0.203	0.154	0.203	0.154
2 1/2 × 1 1/2	2.875	1.900	3.50	0.203	0.145	0.203	0.145
2 1/2 × 1 1/4	2.875	1.660	3.50	0.203	0.140	0.203	0.140
2 1/2 × 1	2.875	1.315	3.50	0.203	0.133	0.203	0.133
3 × 2 1/2	3.500	2.875	3.50	0.216	0.203	0.216	0.203
3 × 2	3.500	2.375	3.50	0.216	0.154	0.216	0.154
3 × 1 1/2	3.500	1.900	3.50	0.216	0.145	0.216	0.145
3 × 1 1/4	3.500	1.660	3.50	0.216	0.140	0.216	0.140
3 1/2 × 3	4.000	3.500	4.00	0.226	0.216	0.226	0.216
3 1/2 × 2 1/2	4.000	2.875	4.00	0.226	0.203	0.226	0.203
3 1/2 × 2	4.000	2.375	4.00	0.226	0.154	0.226	0.154
3 1/2 × 1 1/2	4.000	1.900	4.00	0.226	0.145	0.226	0.145
3 1/2 × 1 1/4	4.000	1.660	4.00	0.226	0.140	0.226	0.140
4 × 3 1/2	4.500	4.000	4.00	0.237	0.226	0.237	0.226
4 × 3	4.500	3.500	4.00	0.237	0.216	0.237	0.216
4 × 2 1/2	4.500	2.875	4.00	0.237	0.203	0.237	0.203
4 × 2	4.500	2.375	4.00	0.237	0.154	0.237	0.154
4 × 1 1/2	4.500	1.900	4.00	0.237	0.145	0.237	0.145



Unit : inch

X-S		Sch80		Sch160		XX-S		Nominal Pipe Size	
T <sub>1</sub>	T <sub>2</sub>								
0.154	0.147	0.154	0.147	0.218	0.188	0.308	0.294	3/4 × 1/2	
0.154	0.126	0.154	0.126	0.218	-	-	-	3/4 × 3/8	
0.179	0.154	0.179	0.154	0.250	0.218	0.358	0.308	1 × 3/4	
0.179	0.147	0.179	0.147	0.250	0.188	0.358	0.294	1 × 1/2	
0.191	0.179	0.191	0.179	0.250	0.250	0.382	0.358	1 1/4 × 1	
0.191	0.154	0.191	0.154	0.250	0.218	0.382	0.308	1 1/4 × 3/4	
0.191	0.147	0.191	0.147	0.250	0.188	0.382	0.294	1 1/4 × 1/2	
0.200	0.191	0.200	0.191	0.281	0.250	0.400	0.382	1 1/2 × 1 1/4	
0.200	0.179	0.200	0.179	0.281	0.250	0.400	0.358	1 1/2 × 1	
0.200	0.154	0.200	0.154	0.281	0.218	0.400	0.308	1 1/2 × 3/4	
0.200	0.147	0.200	0.147	0.281	0.188	0.400	0.294	1 1/2 × 1/2	
0.218	0.200	0.218	0.200	0.344	0.281	0.436	0.400	2 × 1 1/2	
0.218	0.191	0.218	0.191	0.344	0.250	0.436	0.382	2 × 1 1/4	
0.218	0.179	0.218	0.179	0.344	0.250	0.436	0.358	2 × 1	
0.218	0.154	0.218	0.154	0.344	0.218	0.436	0.308	2 × 3/4	
0.276	0.218	0.276	0.218	0.375	0.344	0.552	0.436	2 1/2 × 2	
0.276	0.200	0.276	0.200	0.375	0.281	0.552	0.400	2 1/2 × 1 1/2	
0.276	0.191	0.276	0.191	0.375	0.250	0.552	0.382	2 1/2 × 1 1/4	
0.276	0.179	0.276	0.179	0.375	0.250	0.552	0.358	2 1/2 × 1	
0.300	0.276	0.300	0.276	0.438	0.375	0.600	0.552	3 × 2 1/2	
0.300	0.218	0.300	0.218	0.438	0.344	0.600	0.436	3 × 2	
0.300	0.200	0.300	0.200	0.438	0.281	0.600	0.400	3 × 1 1/2	
0.300	0.191	0.300	0.191	0.438	0.250	0.600	0.382	3 × 1 1/4	
0.318	0.300	0.318	0.300	-	-	-	-	3 1/2 × 3	
0.318	0.276	0.318	0.276	-	-	-	-	3 1/2 × 2 1/2	
0.318	0.218	0.318	0.218	-	-	-	-	3 1/2 × 2	
0.318	0.200	0.318	0.200	-	-	-	-	3 1/2 × 1 1/2	
0.318	0.191	0.318	0.191	-	-	-	-	3 1/2 × 1 1/4	
0.337	0.318	0.337	0.318	-	-	-	-	4 × 3 1/2	
0.337	0.300	0.337	0.300	0.531	0.438	0.674	0.600	4 × 3	
0.337	0.276	0.337	0.276	0.531	0.375	0.674	0.552	4 × 2 1/2	
0.337	0.218	0.337	0.218	0.531	0.344	0.674	0.436	4 × 2	
0.337	0.200	0.337	0.200	0.531	0.281	0.674	0.400	4 × 1 1/2	

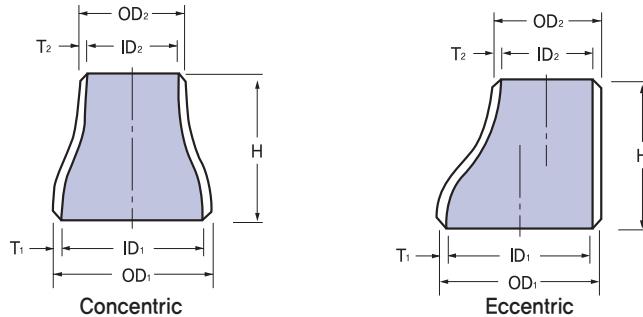
# WROUGHT STEEL BUTT-WELDING FITTING

## • Reducer

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

ASME B16.9

Nominal Pipe Size	Outside Diameter		Center to End	Sch20		Sch30	
	OD <sub>1</sub>	OD <sub>2</sub>		T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>
5 × 4	5.563	4.500	5.00	0.258	0.237	0.258	0.237
5 × 3 ½	5.563	4.000	5.00	0.258	0.226	0.258	0.226
5 × 3	5.563	3.500	5.00	0.258	0.216	0.258	0.216
5 × 2 ½	5.563	2.875	5.00	0.258	0.203	0.258	0.203
5 × 2	5.563	2.375	5.00	0.258	0.154	0.258	0.154
6 × 5	6.625	5.563	5.50	0.280	0.258	0.280	0.258
6 × 4	6.625	4.500	5.50	0.280	0.237	0.280	0.237
6 × 3 ½	6.625	4.000	5.50	0.280	0.226	0.280	0.226
6 × 3	6.625	3.500	5.50	0.280	0.216	0.280	0.216
6 × 2 ½	6.625	2.875	5.50	0.280	0.203	0.280	0.203
8 × 6	8.625	6.625	6.00	0.322	0.280	0.322	0.280
8 × 5	8.625	5.563	6.00	0.322	0.258	0.322	0.258
8 × 4	8.625	4.500	6.00	0.322	0.237	0.322	0.237
8 × 3 ½	8.625	4.000	6.00	0.322	0.226	0.322	0.226
10 × 8	10.750	8.625	7.00	0.365	0.322	0.365	0.322
10 × 6	10.750	6.625	7.00	0.365	0.280	0.365	0.280
10 × 5	10.750	5.563	7.00	0.365	0.258	0.365	0.258
10 × 4	10.750	4.500	7.00	0.365	0.237	0.365	0.237
12 × 10	12.750	10.750	8.00	0.375	0.365	0.406	0.365
12 × 8	12.750	8.625	8.00	0.375	0.322	0.406	0.322
12 × 6	12.750	6.625	8.00	0.375	0.280	0.406	0.280
12 × 5	12.750	5.563	8.00	0.375	0.258	0.406	0.258
14 × 12	14.000	12.750	13.00	0.375	0.375	0.438	0.406
14 × 10	14.000	10.750	13.00	0.375	0.365	0.438	0.365
14 × 8	14.000	8.625	13.00	0.375	0.322	0.438	0.322
14 × 6	14.000	6.625	13.00	0.375	0.280	0.438	0.280



Unit : inch

X-S		Sch80		Sch160		XX-S		Nominal Pipe Size
T <sub>1</sub>	T <sub>2</sub>							
0.375	0.337	0.375	0.337	0.625	0.531	0.750	0.674	5 × 4
0.375	0.318	0.375	0.318	-	-	-	-	5 × 3 ½
0.375	0.300	0.375	0.300	0.625	0.438	0.750	0.600	5 × 3
0.375	0.276	0.375	0.276	0.625	0.375	0.750	0.552	5 × 2 ½
0.375	0.218	0.375	0.218	0.625	0.344	0.750	0.436	5 × 2
0.432	0.375	0.432	0.375	0.719	0.625	0.864	0.750	6 × 5
0.432	0.337	0.432	0.337	0.719	0.531	0.864	0.674	6 × 4
0.432	0.318	0.432	0.318	-	-	-	-	6 × 3 ½
0.432	0.300	0.432	0.300	0.719	0.438	0.864	0.600	6 × 3
0.432	0.276	0.432	0.276	0.719	0.375	0.864	0.552	6 × 2 ½
0.500	0.432	0.500	0.432	0.906	0.719	0.875	0.864	8 × 6
0.500	0.375	0.500	0.375	0.906	0.625	0.875	0.750	8 × 5
0.500	0.337	0.500	0.337	0.906	0.531	0.875	0.674	8 × 4
0.500	0.318	0.500	0.318	-	-	-	-	8 × 3 ½
0.500	0.500	0.594	0.500	1.125	0.906	1.000	0.875	10 × 8
0.500	0.432	0.594	0.432	1.125	0.719	1.000	0.864	10 × 6
0.500	0.375	0.594	0.375	1.125	0.625	1.000	0.750	10 × 5
0.500	0.337	0.594	0.337	1.125	0.531	1.000	0.674	10 × 4
0.500	0.500	0.688	0.594	1.312	1.125	1.000	1.000	12 × 10
0.500	0.500	0.688	0.500	1.312	0.906	1.000	0.875	12 × 8
0.500	0.432	0.688	0.432	1.312	0.719	1.000	0.864	12 × 6
0.500	0.375	0.688	0.375	1.312	0.625	1.000	0.750	12 × 5
0.500	0.500	0.750	0.688	1.406	1.312	-	-	14 × 12
0.500	0.500	0.750	0.594	1.406	1.125	-	-	14 × 10
0.500	0.500	0.750	0.500	1.406	0.906	-	-	14 × 8
0.500	0.432	0.750	0.432	1.406	0.719	-	-	14 × 6

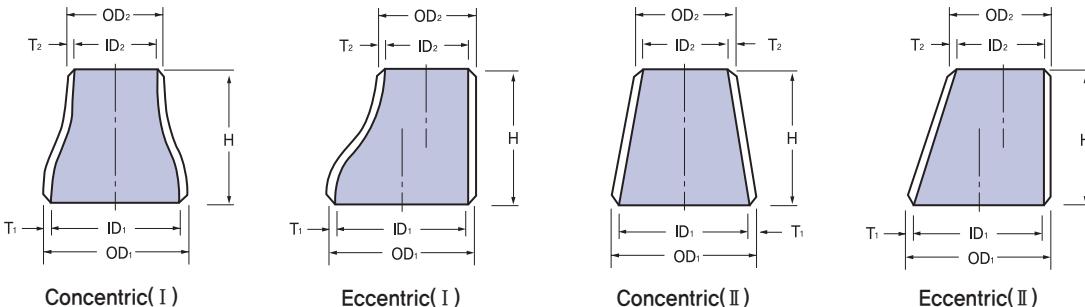
# WROUGHT STEEL BUTT-WELDING FITTING

## • Reducer

STD, Sch40, X-S, Sch80  
Sch160

ASME B16.9

Nominal Pipe Size	Outside Diameter		Center to End	Sch20		Sch30	
	OD <sub>1</sub>	OD <sub>2</sub>		T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>
16 × 14	16.000	14.000	14.00	0.375	0.375	0.500	0.438
16 × 12	16.000	12.750	14.00	0.375	0.375	0.500	0.406
16 × 10	16.000	10.750	14.00	0.375	0.375	0.500	0.365
16 × 8	16.000	8.625	14.00	0.375	0.375	0.500	0.322
18 × 16	18.000	16.000	15.00	0.375	0.375	0.562	0.500
18 × 14	18.000	14.000	15.00	0.375	0.375	0.562	0.438
18 × 12	18.000	12.750	15.00	0.375	0.375	0.562	0.406
18 × 10	18.000	10.750	15.00	0.375	0.375	0.562	0.365
20 × 18	20.000	18.000	20.00	0.375	0.375	0.594	0.562
20 × 16	20.000	16.000	20.00	0.375	0.375	0.594	0.500
20 × 14	20.000	14.000	20.00	0.375	0.375	0.594	0.438
20 × 12	20.000	12.750	20.00	0.375	0.375	0.594	0.406
22 × 20	22.000	20.000	20.00	0.375	0.375	0.594	0.594
22 × 18	22.000	18.000	20.00	0.375	0.375	0.594	0.562
22 × 16	22.000	16.000	20.00	0.375	0.375	0.594	0.500
22 × 14	22.000	14.000	20.00	0.375	0.375	0.594	0.438
24 × 22	24.000	22.000	20.00	0.375	0.375	0.688	0.594
24 × 20	24.000	20.000	20.00	0.375	0.375	0.688	0.594
24 × 18	24.000	18.000	20.00	0.375	0.375	0.688	0.562
24 × 16	24.000	16.000	20.00	0.375	0.375	0.688	0.500
26 × 24	26.000	24.000	24.00	0.375	0.375	0.688	0.688
26 × 22	26.000	22.000	24.00	0.375	0.375	0.688	0.594
26 × 20	26.000	20.000	24.00	0.375	0.375	0.688	0.594
26 × 18	26.000	18.000	24.00	0.375	0.375	0.688	0.562
28 × 26	28.000	26.000	24.00	0.375	0.375	0.688	0.688
28 × 24	28.000	24.000	24.00	0.375	0.375	0.688	0.688
28 × 20	28.000	20.000	24.00	0.375	0.375	0.688	0.594
28 × 18	28.000	18.000	24.00	0.375	0.375	0.688	0.562



Unit : inch

X-S		Sch80		Sch160		Nominal Pipe Size
T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	
0.500	0.500	0.844	0.750	1.594	1.406	16 × 14
0.500	0.500	0.844	0.688	1.594	1.312	16 × 12
0.500	0.500	0.844	0.594	1.594	1.125	16 × 10
0.500	0.500	0.844	0.500	1.594	0.906	16 × 8
0.500	0.500	0.938	0.844	1.781	1.594	18 × 16
0.500	0.500	0.938	0.750	1.781	1.406	18 × 14
0.500	0.500	0.938	0.688	1.781	1.312	18 × 12
0.500	0.500	0.938	0.594	1.781	1.125	18 × 10
0.500	0.500	1.031	0.938	1.969	1.781	20 × 18
0.500	0.500	1.031	0.844	1.969	1.594	20 × 16
0.500	0.500	1.031	0.750	1.969	1.406	20 × 14
0.500	0.500	1.031	0.688	1.969	1.312	20 × 12
0.500	0.500	1.125	1.031	2.125	1.969	22 × 20
0.500	0.500	1.125	0.938	2.125	1.781	22 × 18
0.500	0.500	1.125	0.844	2.125	1.594	22 × 16
0.500	0.500	1.125	0.750	2.125	1.406	22 × 14
0.500	0.500	1.219	1.125	2.344	2.125	24 × 22
0.500	0.500	1.219	1.031	2.344	1.969	24 × 20
0.500	0.500	1.219	0.938	2.344	1.781	24 × 18
0.500	0.500	1.219	0.844	2.344	1.594	24 × 16
0.500	0.500	-	-	-	-	26 × 24
0.500	0.500	-	-	-	-	26 × 22
0.500	0.500	-	-	-	-	26 × 20
0.500	0.500	-	-	-	-	26 × 18
0.500	0.500	-	-	-	-	28 × 26
0.500	0.500	-	-	-	-	28 × 24
0.500	0.500	-	-	-	-	28 × 20
0.500	0.500	-	-	-	-	28 × 18

# WROUGHT STEEL BUTT-WELDING FITTING

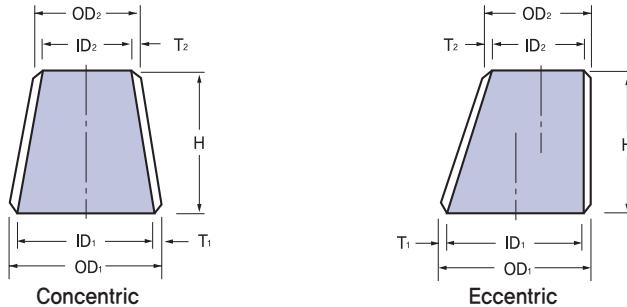
## • Reducer

STD, Sch40, X-S

ASME B16.9

Unit : inch

Nominal Pipe Size	Outside Diameter		End to End	STD		Sch40		X-S	
	OD <sub>1</sub>	OD <sub>2</sub>		H	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>
30 × 28	30.000	28.000	24.00	0.375	0.375	0.688	0.688	0.500	0.500
30 × 26	30.000	26.000	24.00	0.375	0.375	0.688	0.688	0.500	0.500
30 × 24	30.000	24.000	24.00	0.375	0.375	0.688	0.688	0.500	0.500
30 × 20	30.000	20.000	24.00	0.375	0.375	0.688	0.594	0.500	0.500
32 × 30	32.000	30.000	24.00	0.375	0.375	0.688	0.688	0.500	0.500
32 × 28	32.000	28.000	24.00	0.375	0.375	0.688	0.688	0.500	0.500
32 × 26	32.000	26.000	24.00	0.375	0.375	0.688	0.688	0.500	0.500
32 × 24	32.000	24.000	24.00	0.375	0.375	0.688	0.688	0.500	0.500
34 × 32	34.000	32.000	24.00	0.375	0.375	0.688	0.688	0.500	0.500
34 × 30	34.000	30.000	24.00	0.375	0.375	0.688	0.688	0.500	0.500
34 × 26	34.000	26.000	24.00	0.375	0.375	0.688	0.688	0.500	0.500
34 × 24	34.000	24.000	24.00	0.375	0.375	0.688	0.688	0.500	0.500
36 × 34	36.000	34.000	24.00	0.375	0.375	0.750	0.688	0.500	0.500
36 × 32	36.000	32.000	24.00	0.375	0.375	0.750	0.688	0.500	0.500
36 × 30	36.000	30.000	24.00	0.375	0.375	0.750	0.688	0.500	0.500
36 × 26	36.000	26.000	24.00	0.375	0.375	0.750	0.688	0.500	0.500
36 × 24	36.000	24.000	24.00	0.375	0.375	0.750	0.688	0.500	0.500
38 × 36	38.000	36.000	24.00	0.375	0.375	-	-	0.500	0.500
38 × 34	38.000	34.000	24.00	0.375	0.375	-	-	0.500	0.500
38 × 32	38.000	32.000	24.00	0.375	0.375	-	-	0.500	0.500
38 × 30	38.000	30.000	24.00	0.375	0.375	-	-	0.500	0.500
38 × 28	38.000	28.000	24.00	0.375	0.375	-	-	0.500	0.500
38 × 26	38.000	26.000	24.00	0.375	0.375	-	-	0.500	0.500
40 × 38	40.000	38.000	24.00	0.375	0.375	-	-	0.500	0.500
40 × 36	40.000	36.000	24.00	0.375	0.375	-	-	0.500	0.500
40 × 34	40.000	34.000	24.00	0.375	0.375	-	-	0.500	0.500
40 × 32	40.000	32.000	24.00	0.375	0.375	-	-	0.500	0.500
40 × 30	40.000	30.000	24.00	0.375	0.375	-	-	0.500	0.500
42 × 40	42.000	40.000	24.00	0.375	0.375	-	-	0.500	0.500
42 × 38	42.000	38.000	24.00	0.375	0.375	-	-	0.500	0.500
42 × 36	42.000	36.000	24.00	0.375	0.375	-	-	0.500	0.500
42 × 34	42.000	34.000	24.00	0.375	0.375	-	-	0.500	0.500
42 × 32	42.000	32.000	24.00	0.375	0.375	-	-	0.500	0.500
42 × 30	42.000	30.000	24.00	0.375	0.375	-	-	0.500	0.500



ASME B16.9

Unit : inch

Nominal Pipe Size	Outside Diameter		End to End	STD		X-S	
	OD <sub>1</sub>	OD <sub>2</sub>		H	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>
44 × 42	44.000	42.000	24.00	0.375	0.375	0.500	0.500
44 × 40	44.000	40.000	24.00	0.375	0.375	0.500	0.500
44 × 38	44.000	38.000	24.00	0.375	0.375	0.500	0.500
44 × 36	44.000	36.000	24.00	0.375	0.375	0.500	0.500
46 × 44	46.000	44.000	28.00	0.375	0.375	0.500	0.500
46 × 42	46.000	42.000	28.00	0.375	0.375	0.500	0.500
46 × 40	46.000	40.000	28.00	0.375	0.375	0.500	0.500
46 × 38	46.000	38.000	28.00	0.375	0.375	0.500	0.500
48 × 46	48.000	46.000	28.00	0.375	0.375	0.500	0.500
48 × 44	48.000	44.000	28.00	0.375	0.375	0.500	0.500
48 × 42	48.000	42.000	28.00	0.375	0.375	0.500	0.500
48 × 40	48.000	40.000	28.00	0.375	0.375	0.500	0.500
50 × 48	50.000	48.000	30.00	-	-	-	-
50 × 46	50.000	46.000	30.00	-	-	-	-
50 × 44	50.000	44.000	30.00	-	-	-	-
50 × 42	50.000	42.000	30.00	-	-	-	-
52 × 50	52.000	50.000	30.00	-	-	-	-
52 × 48	52.000	48.000	30.00	-	-	-	-
52 × 46	52.000	46.000	30.00	-	-	-	-
52 × 44	52.000	44.000	30.00	-	-	-	-
54 × 52	54.000	52.000	30.00	-	-	-	-
54 × 50	54.000	50.000	30.00	-	-	-	-
54 × 48	54.000	48.000	30.00	-	-	-	-
54 × 46	54.000	46.000	30.00	-	-	-	-
56 × 54	56.000	54.000	30.00	-	-	-	-
56 × 52	56.000	52.000	30.00	-	-	-	-
56 × 50	56.000	50.000	30.00	-	-	-	-
56 × 48	56.000	48.000	30.00	-	-	-	-
58 × 56	58.000	56.000	30.00	-	-	-	-
58 × 54	58.000	54.000	30.00	-	-	-	-
58 × 52	58.000	52.000	30.00	-	-	-	-
58 × 50	58.000	50.000	30.00	-	-	-	-
60 × 58	60.000	58.000	30.00	-	-	-	-
60 × 56	60.000	56.000	30.00	-	-	-	-
60 × 54	60.000	54.000	30.00	-	-	-	-
60 × 52	60.000	52.000	30.00	-	-	-	-

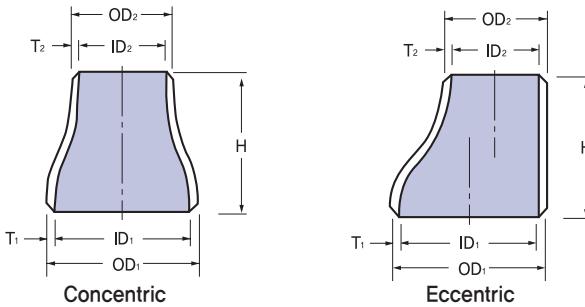
# WROUGHT STEEL BUTT-WELDING FITTING

## • Reducer

Sch20, Sch30, Sch60, Sch100, Sch120, Sch140

ASME B16.9

Nominal Pipe Size	Outside Diameter		End to End	Sch20		Sch30	
	OD <sub>1</sub>	OD <sub>2</sub>		H	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>
5 × 4	5.563	4.500	5.00	-	-	-	-
6 × 5	6.625	5.563	5.50	-	-	-	-
6 × 4	6.625	4.500	5.50	-	-	-	-
8 × 6	8.625	6.625	6.00	-	-	-	-
8 × 5	8.625	5.563	6.00	-	-	-	-
8 × 4	8.625	4.500	6.00	-	-	-	-
10 × 8	10.750	8.625	7.00	0.250	0.250	0.307	0.277
10 × 6	10.750	6.625	7.00	-	-	-	-
10 × 5	10.750	5.563	7.00	-	-	-	-
10 × 4	10.750	4.500	7.00	-	-	-	-
12 × 10	12.750	10.750	8.00	0.250	0.250	0.330	0.307
12 × 8	12.750	8.625	8.00	0.250	0.250	0.330	0.277
12 × 6	12.750	6.625	8.00	-	-	-	-
12 × 5	12.750	5.563	8.00	-	-	-	-
14 × 12	14.000	12.750	13.00	0.312	0.250	0.375	0.330
14 × 10	14.000	10.750	13.00	0.312	0.250	0.375	0.307
14 × 8	14.000	8.625	13.00	0.312	0.250	0.375	0.277
14 × 6	14.000	6.625	13.00	-	-	-	-
16 × 14	16.000	14.000	14.00	0.312	0.312	0.375	0.375
16 × 12	16.000	12.750	14.00	0.312	0.250	0.375	0.330
16 × 10	16.000	10.750	14.00	0.312	0.250	0.375	0.307
16 × 8	16.000	8.625	14.00	0.312	0.250	0.375	0.277
18 × 16	18.000	16.000	15.00	0.312	0.312	0.438	0.375
18 × 14	18.000	14.000	15.00	0.312	0.312	0.438	0.375
18 × 12	18.000	12.750	15.00	0.312	0.250	0.438	0.330
18 × 10	18.000	10.750	15.00	0.312	0.250	0.438	0.307
20 × 18	20.000	18.000	20.00	0.375	0.375	0.500	0.438
20 × 16	20.000	16.000	20.00	0.375	0.375	0.500	0.375
20 × 14	20.000	14.000	20.00	0.375	0.375	0.500	0.375
20 × 12	20.000	12.750	20.00	0.375	0.250	0.500	0.330



Unit : inch

Sch60		Sch100		Sch120		Sch140		Nominal Pipe Size
T <sub>1</sub>	T <sub>2</sub>							
-	-	-	-	0.500	0.438	-	-	5 × 4
-	-	-	-	0.562	0.500	-	-	6 × 5
-	-	-	-	0.562	0.438	-	-	6 × 4
-	-	-	-	0.719	0.562	-	-	8 × 6
-	-	-	-	0.719	0.500	-	-	8 × 5
-	-	-	-	0.719	0.438	-	-	8 × 4
0.500	0.406	0.719	0.594	0.844	0.719	1.000	0.812	10 × 8
-	-	-	-	0.844	0.562	-	-	10 × 6
-	-	-	-	0.844	0.500	-	-	10 × 5
-	-	-	-	0.844	0.438	-	-	10 × 4
0.562	0.500	0.844	0.719	1.000	0.844	1.125	1.000	12 × 10
0.562	0.406	0.844	0.594	1.000	0.719	1.125	0.812	12 × 8
-	-	-	-	1.000	0.562	-	-	12 × 6
-	-	-	-	1.000	0.500	-	-	12 × 5
0.594	0.562	0.938	0.844	1.094	1.000	1.250	1.125	14 × 12
0.594	0.500	0.938	0.719	1.094	0.844	1.250	1.000	14 × 10
0.594	0.406	0.938	0.594	1.094	0.719	1.250	0.812	14 × 8
-	-	-	-	1.094	0.562	-	-	14 × 6
0.656	0.594	1.031	0.938	1.219	1.094	1.438	1.250	16 × 14
0.656	0.562	1.031	0.844	1.219	1.000	1.438	1.125	16 × 12
0.656	0.500	1.031	0.719	1.219	0.844	1.438	1.000	16 × 10
0.656	0.406	1.031	0.594	1.219	0.719	1.438	0.812	16 × 8
0.750	0.656	1.156	1.031	1.375	1.219	1.562	1.438	18 × 16
0.750	0.594	1.156	0.938	1.375	1.094	1.562	1.250	18 × 14
0.750	0.562	1.156	0.844	1.375	1.000	1.562	1.125	18 × 12
0.750	0.500	1.156	0.719	1.375	0.844	1.562	1.000	18 × 10
0.812	0.750	1.281	1.156	1.500	1.375	1.750	1.562	20 × 18
0.812	0.656	1.281	1.031	1.500	1.219	1.750	1.438	20 × 16
0.812	0.594	1.281	0.938	1.500	1.094	1.750	1.250	20 × 14
0.812	0.562	1.281	0.844	1.500	1.000	1.750	1.125	20 × 12

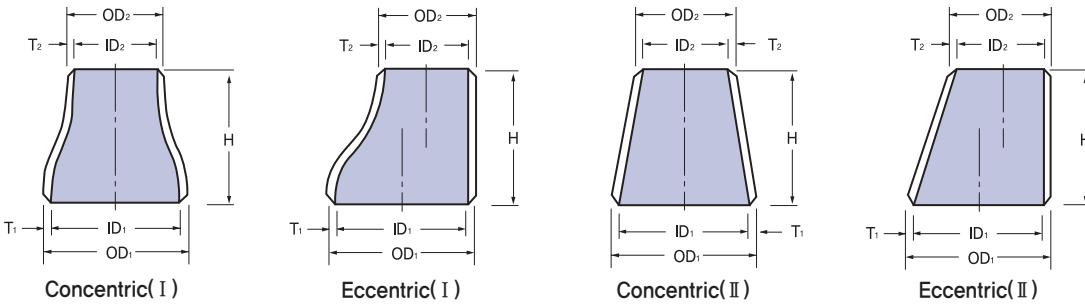
# WROUGHT STEEL BUTT-WELDING FITTING

## • Reducer

Sch20, Sch30, Sch60, Sch100, Sch120, Sch140

ASME B16.9

Nominal Pipe Size	Outside Diameter		End to End	Sch20		Sch30	
	OD <sub>1</sub>	OD <sub>2</sub>		T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>
22 × 20	22.000	20.000	20.00	0.375	0.375	0.500	0.500
22 × 18	22.000	18.000	20.00	0.375	0.312	0.500	0.438
22 × 16	22.000	16.000	20.00	0.375	0.312	0.500	0.375
22 × 14	22.000	14.000	20.00	0.375	0.312	0.500	0.375
24 × 22	24.000	22.000	20.00	0.375	0.375	0.562	0.500
24 × 20	24.000	20.000	20.00	0.375	0.375	0.562	0.500
24 × 18	24.000	18.000	20.00	0.375	0.312	0.562	0.438
24 × 16	24.000	16.000	20.00	0.375	0.312	0.562	0.375
26 × 24	26.000	24.000	24.00	0.500	0.375	-	-
26 × 22	26.000	22.000	24.00	0.500	0.375	-	-
26 × 20	26.000	20.000	24.00	0.500	0.375	-	-
26 × 18	26.000	18.000	24.00	0.500	0.312	-	-
28 × 26	28.000	26.000	24.00	0.500	0.500	-	-
28 × 24	28.000	24.000	24.00	0.500	0.375	0.625	0.562
28 × 20	28.000	20.000	24.00	0.500	0.375	0.625	0.500
28 × 18	28.000	18.000	24.00	0.500	0.312	0.625	0.438
30 × 28	30.000	28.000	24.00	0.500	0.500	0.625	0.625
30 × 26	30.000	26.000	24.00	0.500	0.500	-	-
30 × 24	30.000	24.000	24.00	0.500	0.375	0.625	0.562
30 × 20	30.000	20.000	24.00	0.500	0.375	0.625	0.500
32 × 30	32.000	30.000	24.00	0.500	0.500	0.625	0.625
32 × 28	32.000	28.000	24.00	0.500	0.500	0.625	0.625
32 × 26	32.000	26.000	24.00	0.500	0.500	-	-
32 × 24	32.000	24.000	24.00	0.500	0.375	0.625	0.562
34 × 32	34.000	32.000	24.00	0.500	0.500	0.625	0.625
34 × 30	34.000	30.000	24.00	0.500	0.500	0.625	0.625
34 × 28	34.000	28.000	24.00	0.500	0.500	0.625	0.625
34 × 26	34.000	26.000	24.00	0.500	0.500	-	-
36 × 34	36.000	34.000	24.00	0.500	0.500	0.625	0.625
36 × 32	36.000	32.000	24.00	0.500	0.500	0.625	0.625
36 × 30	36.000	30.000	24.00	0.500	0.500	0.625	0.625
36 × 28	36.000	28.000	24.00	0.500	0.500	0.625	0.625



Unit : inch

Sch60		Sch100		Sch120		Sch140		Nominal Pipe Size
T <sub>1</sub>	T <sub>2</sub>							
0.875	0.812	1.375	1.281	1.625	1.500	1.875	1.750	22 × 20
0.875	0.750	1.375	1.156	1.625	1.375	1.875	1.562	22 × 18
0.875	0.656	1.375	1.031	1.625	1.219	1.875	1.438	22 × 16
0.875	0.594	1.375	0.938	1.625	1.094	1.875	1.250	22 × 14
0.969	0.875	1.531	1.375	1.812	1.625	2.062	1.875	24 × 22
0.969	0.812	1.531	1.281	1.812	1.500	2.062	1.750	24 × 20
0.969	0.750	1.531	1.156	1.812	1.375	2.062	1.562	24 × 18
0.969	0.656	1.531	1.031	1.812	1.219	2.062	1.438	24 × 16
-	-	-	-	-	-	-	-	26 × 24
-	-	-	-	-	-	-	-	26 × 22
-	-	-	-	-	-	-	-	26 × 20
-	-	-	-	-	-	-	-	26 × 18
-	-	-	-	-	-	-	-	28 × 26
-	-	-	-	-	-	-	-	28 × 24
-	-	-	-	-	-	-	-	28 × 20
-	-	-	-	-	-	-	-	28 × 18
-	-	-	-	-	-	-	-	30 × 28
-	-	-	-	-	-	-	-	30 × 26
-	-	-	-	-	-	-	-	30 × 24
-	-	-	-	-	-	-	-	30 × 20
-	-	-	-	-	-	-	-	32 × 30
-	-	-	-	-	-	-	-	32 × 28
-	-	-	-	-	-	-	-	32 × 26
-	-	-	-	-	-	-	-	32 × 24
-	-	-	-	-	-	-	-	34 × 32
-	-	-	-	-	-	-	-	34 × 30
-	-	-	-	-	-	-	-	34 × 28
-	-	-	-	-	-	-	-	34 × 26
-	-	-	-	-	-	-	-	36 × 34
-	-	-	-	-	-	-	-	36 × 32
-	-	-	-	-	-	-	-	36 × 30
-	-	-	-	-	-	-	-	36 × 28

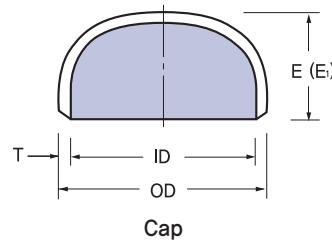
# WROUGHT STEEL BUTT-WELDING FITTING

## • Cap

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

ASME B16.9

Nominal Pipe Size	Outside Diameter O.D	Length E	Limiting Wall Thickness for Length E	Length E <sub>1</sub>	STD		Sch 40	
					T	I.D	T	I.D
½	0.840	1.00	0.18	1.00	0.109	0.622	0.109	0.622
¾	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 ¼	1.660	1.50	0.19	1.50	0.140	1.380	0.140	1.380
1 ½	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 ½	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 ½	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	16.23	-	-	-	-	-	-



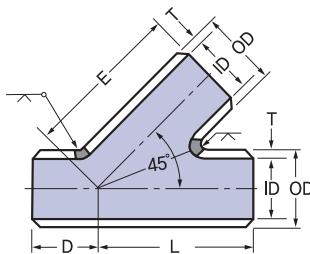
Unit : inch

X-5		Sch80		Sch160		XX-5		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	0.218	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	1.968	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
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-

# WROUGHT STEEL BUTT-WELDING FITTING

## • Lateral

STD, X-S



Unit : inch

Nominal Pipe Size	Outside Diameter O.D	STD					X-S				
		E&L	D	T	ID	WT(kg)	E&L	D	T	ID	WT(kg)
1	1.315	5.75	1.75	0.133	1.049	0.77	6.50	2.00	0.179	0.957	1.130
1 ¼	1.660	6.25	1.75	0.140	1.380	1.09	7.25	2.25	0.191	1.278	1.720
1 ½	1.900	7.00	2.00	0.145	1.610	1.45	8.50	2.50	0.200	1.500	2.450
2	2.375	8.00	2.50	0.154	2.067	2.27	9.00	2.50	0.128	1.939	3.400
2 ½	2.875	9.50	2.50	0.203	2.469	4.17	10.50	2.50	0.276	2.323	6.150
3	3.500	10.00	3.00	0.216	3.068	5.72	11.00	3.00	0.300	2.900	8.530
3 ½	4.000	11.50	3.00	0.226	3.548	7.80	12.50	3.00	0.318	3.364	11.610
4	4.500	12.00	3.00	0.237	4.026	9.43	13.50	3.00	0.337	3.826	14.880
5	5.562	13.50	3.50	0.258	5.047	14.24	15.00	3.50	0.375	4.813	22.590
6	6.625	14.50	3.50	0.280	6.065	19.23	17.50	4.00	0.432	5.761	35.830
8	8.625	17.50	4.50	0.322	7.981	34.47	20.50	5.00	0.500	7.625	63.500
10	10.750	20.50	5.00	0.365	10.020	56.25	24.00	5.50	0.500	9.750	96.630
12	12.750	24.50	5.50	0.375	12.000	81.65	27.50	6.00	0.500	11.750	123.830
14	14.000	27.00	6.00	0.375	13.250	98.88	31.00	6.50	0.500	13.000	154.220
16	16.000	30.00	6.50	0.375	15.250	124.74	34.50	7.50	0.500	15.000	196.410
18	18.000	32.00	7.00	0.375	17.250	147.87	37.50	8.00	0.500	17.000	238.590
20	20.000	35.00	8.00	0.375	19.250	179.63	40.50	8.50	0.500	19.000	284.860
24	24.000	40.50	9.00	0.375	23.250	246.76	47.50	10.00	0.500	23.000	400.080

■ ASME

# STAINLESS STEEL BUTT-WELDING FITTINGS

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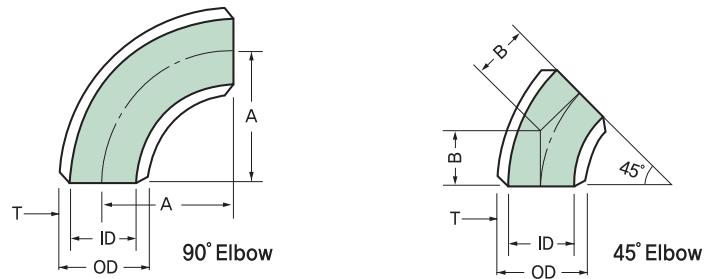
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# STAINLESS STEEL BUTT-WELDING FITTINGS

- **90° Elbow (Long, Short)**

- **45° Elbow (Long)**

Sch5s, Sch10s, Sch40s, Sch80s



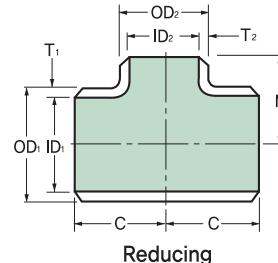
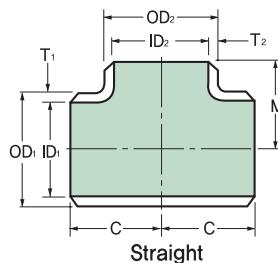
ASME B16.9

Unit : inch

Nominal Pipe Size	Outside Diameter OD	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	0.62	-	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	9.750
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	-	-	-	-

**• 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 <sub>1</sub>	OD <sub>2</sub>	RUN C	Outlet M	T <sub>1</sub>	T <sub>2</sub>						
1/2 × 1/2 × 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 × 1/2 × 3/8	0.840	0.675	1.00	1.00	-	-	0.083	0.065	0.109	0.109	0.147	0.126
1/2 × 1/2 × 1/4	0.840	0.540	1.00	1.00	-	-	0.083	0.065	0.109	0.088	0.147	0.119
3/4 × 3/4 × 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 × 3/4 × 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 × 3/4 × 3/8	1.050	0.675	1.12	1.12	-	-	0.083	0.065	0.113	0.091	0.154	0.126
1 × 1 × 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 × 1 × 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 × 1 × 1/2	1.315	0.840	1.50	1.50	0.065	0.065	0.109	0.083	0.133	0.109	0.179	0.147
1 1/4 × 1 1/4 × 1 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 1/4 × 1 1/4 × 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 1/4 × 1 1/4 × 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 1/4 × 1 1/4 × 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 × 1 1/2 × 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 × 1 1/2 × 1 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 × 1 1/2 × 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 × 1 1/2 × 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 × 1 1/2 × 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 × 2 × 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 × 2 × 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 × 2 × 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 × 2 × 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 × 2 × 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 × 2 1/2 × 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 × 2 1/2 × 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 × 2 1/2 × 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 × 2 1/2 × 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 × 2 1/2 × 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 × 3 × 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 × 3 × 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 × 3 × 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 × 3 × 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 × 3 × 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 × 3 1/2 × 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 × 3 1/2 × 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 × 3 1/2 × 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 × 3 1/2 × 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 × 3 1/2 × 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

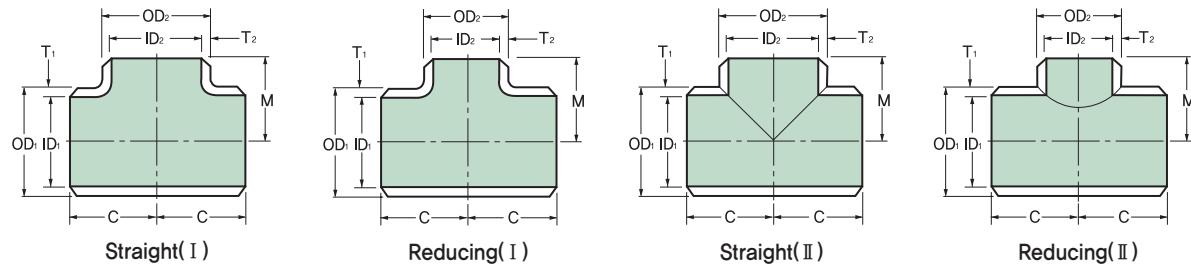
## • Tee

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	
	OD1	OD2	RUN C	Outlet M	T <sub>1</sub>	T <sub>2</sub>						
4× 4× 4	4.500	4.500	4.12	4.12	0.083	0.083	0.120	0.120	0.237	0.237	0.337	0.337
4× 4× 3½	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× 4× 3	4.500	3.500	4.12	3.88	0.083	0.083	0.120	0.120	0.237	0.216	0.337	0.300
4× 4× 2½	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× 4× 2	4.500	2.375	4.12	3.50	0.083	0.065	0.120	0.109	0.237	0.154	0.337	0.218
4× 4× 1½	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× 5× 5	5.563	5.563	4.88	4.88	0.109	0.109	0.134	0.134	0.258	0.258	0.375	0.375
5× 5× 4	5.563	4.500	4.88	4.62	0.109	0.083	0.134	0.120	0.258	0.237	0.375	0.337
5× 5× 3½	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× 5× 3	5.563	3.500	4.88	4.38	0.109	0.083	0.134	0.120	0.258	0.216	0.375	0.300
5× 5× 2½	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× 5× 2	5.563	2.375	4.88	4.12	0.109	0.065	0.134	0.109	0.258	0.154	0.375	0.218
6× 6× 6	6.625	6.625	5.62	5.62	0.109	0.109	0.134	0.134	0.280	0.280	0.432	0.432
6× 6× 5	6.625	5.563	5.62	5.38	0.109	0.109	0.134	0.134	0.280	0.258	0.432	0.375
6× 6× 4	6.625	4.500	5.62	5.12	0.109	0.083	0.134	0.120	0.280	0.237	0.432	0.337
6× 6× 3½	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× 6× 3	6.625	3.500	5.62	4.88	0.109	0.083	0.134	0.120	0.280	0.216	0.432	0.300
6× 6× 2½	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× 8× 8	8.625	8.625	7.00	7.00	0.109	0.109	0.148	0.148	0.322	0.322	0.500	0.500
8× 8× 6	8.625	6.625	7.00	6.62	0.109	0.109	0.148	0.134	0.322	0.280	0.520	0.432
8× 8× 5	8.625	5.563	7.00	6.38	0.109	0.109	0.148	0.134	0.322	0.258	0.500	0.375
8× 8× 4	8.625	4.500	7.00	6.12	0.109	0.083	0.148	0.120	0.322	0.237	0.500	0.337
8× 8× 3½	8.625	4.000	7.00	6.00	0.109	0.083	0.148	0.120	0.322	0.226	0.500	0.318
10×10×10	10.750	10.750	8.50	8.50	0.134	0.134	0.165	0.165	0.365	0.365	0.500	0.500
10×10× 8	10.750	8.625	8.50	8.00	0.134	0.109	0.165	0.148	0.365	0.322	0.500	0.500
10×10× 6	10.750	6.625	8.50	7.62	0.134	0.109	0.165	0.134	0.365	0.280	0.500	0.432
10×10× 5	10.750	5.563	8.50	7.50	0.134	0.109	0.165	0.134	0.365	0.258	0.500	0.375
10×10× 4	10.750	4.500	8.50	7.25	0.134	0.083	0.165	0.120	0.365	0.237	0.520	0.337
12×12×12	12.750	12.750	10.00	10.00	0.156	0.156	0.180	0.180	0.375	0.375	0.500	0.500
12×12×10	12.750	10.750	10.00	9.50	0.156	0.134	0.180	0.165	0.375	0.365	0.500	0.500
12×12× 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
12×12× 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
12×12× 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
14×14×14	14.000	14.000	11.00	11.00	0.156	0.156	0.188	0.188	-	-	-	-
14×14×12	14.000	12.750	11.00	10.62	0.156	0.156	0.188	0.180	-	-	-	-
14×14×10	14.000	10.750	11.00	10.12	0.156	0.134	0.188	0.165	-	-	-	-
14×14× 8	14.000	8.625	11.00	9.75	0.156	0.109	0.188	0.148	-	-	-	-
14×14× 6	14.000	6.625	11.00	9.38	0.156	0.109	0.188	0.134	-	-	-	-



ASME B16.9

Unit : inch

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

# STAINLESS STEEL BUTT-WELDING FITTINGS

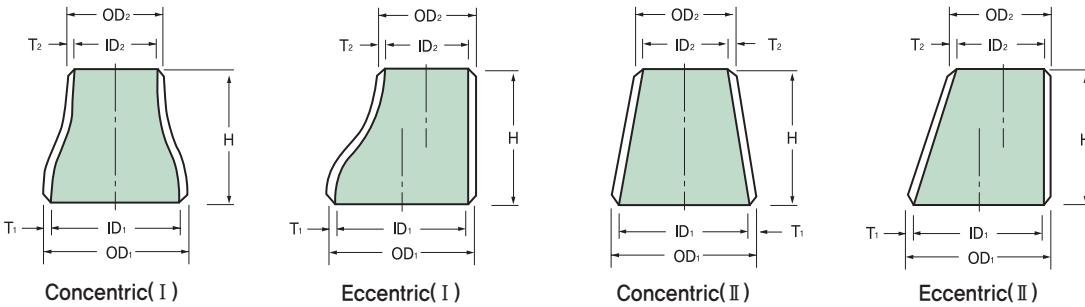
## • Reducer

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		
	OD1	OD2		T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	
3/4 × 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 × 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 × 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 × 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 × 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 × 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 × 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 × 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 × 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 × 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 × 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 × 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 × 1	2.375	1.315	3.00	0.065	0.065	0.109	0.109	0.154	0.133	0.218	0.179	
2 × 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 × 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 × 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 × 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 × 1	2.875	1.315	3.50	0.083	0.065	0.120	0.109	0.203	0.133	0.276	0.179	
3 × 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 × 2	3.500	2.375	3.50	0.083	0.065	0.120	0.109	0.216	0.154	0.300	0.218	
3 × 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 × 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 × 3	4.000	3.500	4.00	0.083	0.083	0.120	0.120	0.226	0.216	0.318	0.300	
3 1/2 × 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 × 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 × 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 × 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 × 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 × 3	4.500	3.500	4.00	0.083	0.083	0.120	0.120	0.237	0.216	0.337	0.300	
4 × 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 × 2	4.500	2.375	4.00	0.083	0.065	0.120	0.109	0.237	0.154	0.337	0.218	
4 × 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 × 4	5.563	4.500	5.00	0.109	0.083	0.134	0.120	0.258	0.237	0.375	0.337	
5 × 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 × 3	5.563	3.500	5.00	0.109	0.083	0.134	0.120	0.258	0.216	0.375	0.300	
5 × 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 × 2	5.563	2.375	5.00	0.109	0.065	0.134	0.109	0.258	0.154	0.375	0.218	
6 × 5	6.625	5.563	5.50	0.109	0.109	0.134	0.134	0.280	0.258	0.432	0.375	
6 × 4	6.625	4.500	5.50	0.109	0.083	0.134	0.120	0.280	0.237	0.432	0.337	
6 × 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 × 3	6.625	3.500	5.50	0.109	0.083	0.134	0.120	0.280	0.216	0.432	0.300	
6 × 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

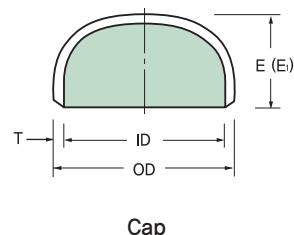
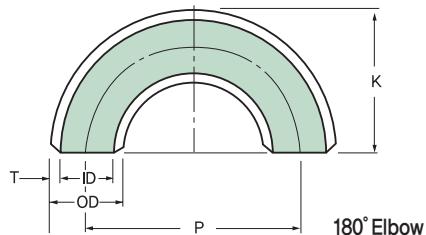
Nominal Pipe Size	Outside Diameter		End to End H	Wall Thickness T								
	Sch 5s			Sch 10s		Sch 40s		Sch 80s				
	OD <sub>1</sub>	OD <sub>2</sub>		T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	T <sub>1</sub>	T <sub>2</sub>	
8 × 6	8.625	6.625	6.00	0.109	0.109	0.148	0.134	0.322	0.280	0.500	0.432	
8 × 5	8.625	5.563	6.00	0.109	0.109	0.148	0.134	0.322	0.258	0.500	0.375	
8 × 4	8.625	4.500	6.00	0.109	0.083	0.148	0.120	0.322	0.237	0.500	0.337	
8 × 3½	8.625	4.000	6.00	0.109	0.083	0.148	0.120	0.322	0.226	0.500	0.318	
10 × 8	10.750	8.625	7.00	0.134	0.109	0.165	0.148	0.365	0.322	0.500	0.500	
10 × 6	10.750	6.625	7.00	0.134	0.109	0.165	0.134	0.365	0.280	0.500	0.432	
10 × 5	10.750	5.563	7.00	0.134	0.109	0.165	0.134	0.365	0.258	0.500	0.375	
10 × 4	10.750	4.500	7.00	0.134	0.083	0.165	0.120	0.365	0.237	0.500	0.337	
12 × 10	12.750	10.750	8.00	0.156	0.134	0.180	0.165	0.375	0.365	0.500	0.500	
12 × 8	12.750	8.625	8.00	0.156	0.109	0.180	0.148	0.375	0.322	0.500	0.500	
12 × 6	12.750	6.625	8.00	0.156	0.109	0.180	0.134	0.375	0.280	0.500	0.432	
12 × 5	12.750	5.563	8.00	0.156	0.109	0.180	0.134	0.375	0.258	0.500	0.375	
14 × 12	14.000	12.750	13.00	0.156	0.156	0.188	0.180	-	-	-	-	
14 × 10	14.000	10.750	13.00	0.156	0.134	0.188	0.165	-	-	-	-	
14 × 8	14.000	8.625	13.00	0.156	0.109	0.188	0.148	-	-	-	-	
14 × 6	14.000	6.625	13.00	0.156	0.109	0.188	0.134	-	-	-	-	
16 × 14	16.000	14.000	14.00	0.165	0.156	0.188	0.188	-	-	-	-	
16 × 12	16.000	12.750	14.00	0.165	0.156	0.188	0.180	-	-	-	-	
16 × 10	16.000	10.750	14.00	0.165	0.134	0.188	0.165	-	-	-	-	
16 × 8	16.000	8.625	14.00	0.165	0.109	0.188	0.148	-	-	-	-	
18 × 16	18.000	16.000	15.00	0.165	0.165	0.188	0.188	-	-	-	-	
18 × 14	18.000	14.000	15.00	0.165	0.156	0.188	0.188	-	-	-	-	
18 × 12	18.000	12.750	15.00	0.165	0.156	0.188	0.180	-	-	-	-	
18 × 10	18.000	10.750	15.00	0.165	0.134	0.188	0.165	-	-	-	-	
20 × 18	20.000	18.000	20.00	0.188	0.165	0.218	0.188	-	-	-	-	
20 × 16	20.000	16.000	20.00	0.188	0.165	0.218	0.188	-	-	-	-	
20 × 14	20.000	14.000	20.00	0.188	0.156	0.218	0.188	-	-	-	-	
20 × 12	20.000	12.750	20.00	0.188	0.156	0.218	0.180	-	-	-	-	
22 × 20	22.000	20.000	20.00	0.188	0.188	0.218	0.218	-	-	-	-	
22 × 18	22.000	18.000	20.00	0.188	0.165	0.218	0.188	-	-	-	-	
22 × 16	22.000	16.000	20.00	0.188	0.165	0.218	0.188	-	-	-	-	
22 × 14	22.000	14.000	20.00	0.188	0.156	0.218	0.188	-	-	-	-	
24 × 22	24.000	22.000	20.00	0.218	0.188	0.250	0.218	-	-	-	-	
24 × 20	24.000	20.000	20.00	0.218	0.188	0.250	0.218	-	-	-	-	
24 × 18	24.000	18.000	20.00	0.218	0.165	0.250	0.188	-	-	-	-	
24 × 16	24.000	16.000	20.00	0.218	0.165	0.250	0.188	-	-	-	-	
30 × 24	30.000	24.000	24.00	0.250	0.218	0.312	0.250	-	-	-	-	
30 × 22	30.000	22.000	24.00	0.250	0.188	0.312	0.218	-	-	-	-	
30 × 20	30.000	20.000	24.00	0.250	0.188	0.312	0.218	-	-	-	-	

# STAINLESS STEEL BUTT-WELDING FITTINGS

- **180° Elbow (Long,Short)**

- **Cap**

Sch5s, Sch10s, Sch40s, Sch80s

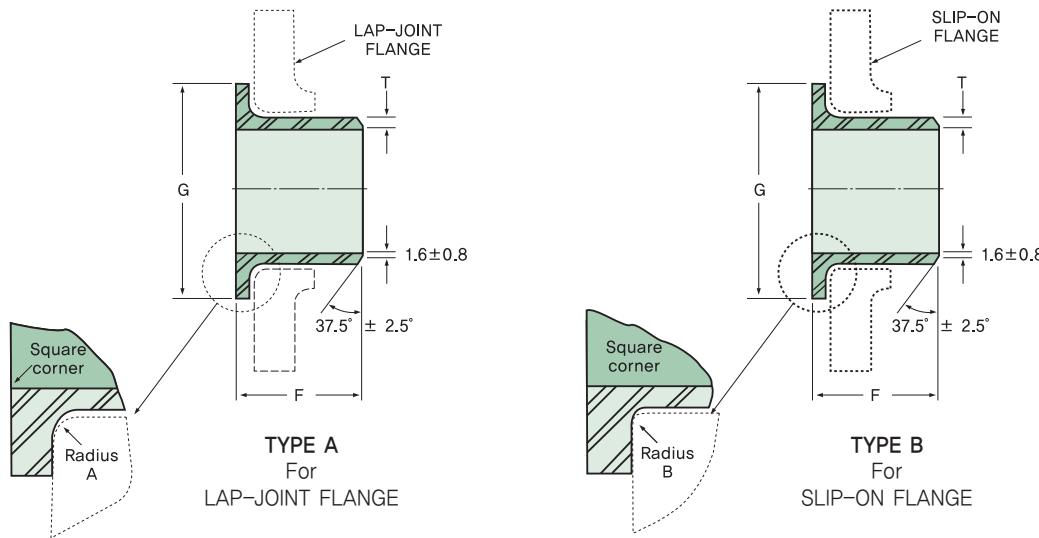


ASME B16.9

Unit : inch

Nominal Pipe Size	Outside Diameter OD	Wall Thickness T				Length E	Limiting Wall Thickness For Length E	Length E <sub>1</sub>	Wall Thickness T						
									Long		Short				
		5s	10s	40s	80s				O	K	O	K			
1/2	0.840	0.065	0.083	0.109	0.147	1.00	0.18	1.00	3.00	1.88	-	-			
3/4	1.050	0.065	0.083	0.113	0.154	1.00	0.15	1.00	3.00	1.88	-	-			
1	1.315	0.065	0.109	0.133	0.179	1.50	0.18	1.50	3.00	2.19	2.00	1.62			
1 1/4	1.660	0.065	0.109	0.140	0.191	1.50	0.19	1.50	3.75	2.75	2.50	2.06			
1 1/2	1.900	0.065	0.109	0.145	0.200	1.50	0.20	1.50	4.50	3.25	3.00	2.44			
2	2.375	0.065	0.109	0.154	0.218	1.50	0.22	1.75	6.00	4.19	4.00	3.19			
2 1/2	2.875	0.083	0.120	0.203	0.276	1.50	0.28	2.00	7.50	5.19	5.00	3.94			
3	3.500	0.083	0.120	0.216	0.300	2.00	0.30	2.50	9.00	6.25	6.00	4.75			
3 1/2	4.000	0.083	0.120	0.226	0.318	2.50	0.32	3.00	10.50	7.25	7.00	5.50			
4	4.500	0.083	0.120	0.237	0.337	2.50	0.34	3.00	12.00	8.25	8.00	6.25			
5	5.563	0.109	0.134	0.258	0.375	3.00	0.38	3.50	15.00	10.31	10.00	7.75			
6	6.625	0.109	0.134	0.280	0.432	3.50	0.43	4.00	18.00	12.31	12.00	9.31			
8	8.625	0.109	0.148	0.322	0.500	4.00	0.50	5.00	24.00	16.31	16.00	12.31			
10	10.750	0.134	0.165	0.365	0.500	5.00	0.50	6.00	30.00	20.38	20.00	15.38			
12	12.750	0.156	0.180	0.375	0.500	6.00	0.50	7.00	36.00	24.38	24.00	18.38			
14	14.000	0.156	0.188	-	-	6.50	0.50	7.50	42.00	28.00	28.00	21.00			
16	16.000	0.165	0.188	-	-	7.00	0.50	8.00	48.00	32.00	32.00	24.00			
18	18.000	0.165	0.188	-	-	8.00	0.50	9.00	54.00	36.00	36.00	27.00			
20	20.000	0.188	0.218	-	-	9.00	0.50	10.00	60.00	40.00	40.00	30.00			
22	22.000	0.188	0.218	-	-	10.00	0.50	10.00	66.00	44.00	44.00	33.00			
24	24.000	0.218	0.250	-	-	10.50	0.50	12.00	72.00	48.00	48.00	36.00			
30	30.000	0.250	0.312	-	-	10.50	-	-	-	-	-	-			

## • Lap Joint Stub End



MSS SP-43, ASME B 16.9

Unit : inch

Nominal Pipe Size	Outside Diameter OD	Length F			Dia. of Lap-G Nominal & Maximum	Radius of Fillet		Wall Thickness T		
		MSS	ANSI Long	ANSI Short		A Max.	B Max.	Sch 5s	Sch 10s	Sch 40s
1/2	0.840	2.00	3.00	2.00	1.38	0.12	0.03	0.065	0.083	0.109
3/4	1.050	2.00	3.00	2.00	1.69	0.12	0.03	0.065	0.083	0.113
1	1.315	2.00	4.00	2.00	2.00	0.12	0.03	0.065	0.109	0.133
1 1/4	1.660	2.00	4.00	2.00	2.50	0.19	0.03	0.065	0.109	0.140
1 1/2	1.900	2.00	4.00	2.00	2.88	0.25	0.03	0.065	0.109	0.145
2	2.375	2.50	6.00	2.50	3.62	0.31	0.03	0.065	0.109	0.154
2 1/2	2.875	2.50	6.00	2.50	4.12	0.31	0.03	0.083	0.120	0.203
3	3.500	2.50	6.00	2.50	5.00	0.38	0.03	0.083	0.120	0.216
3 1/2	4.000	3.00	6.00	3.00	5.50	0.38	0.03	0.083	0.120	0.226
4	4.500	3.00	6.00	3.00	6.19	0.44	0.03	0.083	0.120	0.237
5	5.563	3.00	8.00	3.00	7.31	0.44	0.06	0.109	0.134	0.258
6	6.625	3.50	8.00	3.50	8.50	0.50	0.06	0.109	0.134	0.280
8	8.625	4.00	8.00	4.00	10.62	0.50	0.06	0.109	0.148	0.322
10	10.750	5.00	10.00	5.00	12.75	0.50	0.06	0.134	0.165	0.365
12	12.750	6.00	10.00	6.00	15.00	0.50	0.06	0.156	0.180	0.375
14	14.000	6.00	12.00	6.00	16.25	0.50	0.06	0.156	0.188	-
16	16.000	6.00	12.00	6.00	18.50	0.50	0.06	0.165	0.188	-
18	18.000	6.00	12.00	6.00	21.00	0.50	0.06	0.165	0.188	-
20	20.000	6.00	12.00	6.00	23.00	0.50	0.06	0.188	0.218	-
22	22.000	6.00	12.00	6.00	25.25	0.50	0.06	0.188	0.218	-
24	24.000	6.00	12.00	6.00	27.25	0.50	0.06	0.218	0.250	-

# REFERENCES

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# APPROX WEIGHT EQUATION

MSB [주]엠에스밴드

STEEL | KS/JIS

STAINLESS | KS/JIS  
STEEL

STEEL | ASME

STAINLESS | ASME

REFERENCES

## 1. ELBOW

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

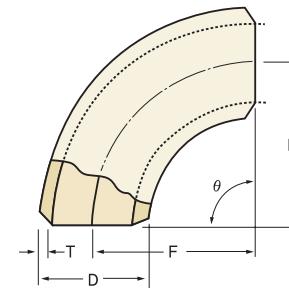
W = Weight(kg)

F = Center to End (mm)

D = Outside Diameter (mm)

T = Wall Thickness (mm)

$\theta$  = 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<sub>1</sub>= Outside Diameter (mm)

t<sub>1</sub> = Wall Thickness (mm)

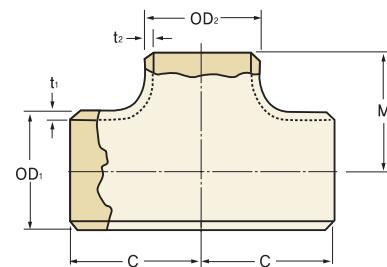
OD<sub>2</sub>= Outside Diameter (mm)

t<sub>2</sub> = Wall Thickness (mm)

M = Center to End (mm)

K = 1(PLATE)

K = 1,363 (PIPE)



## 3. REDUCER

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

$$l = \sqrt{H^2 + \frac{(OD_1-OD_2)^2}{4}}$$

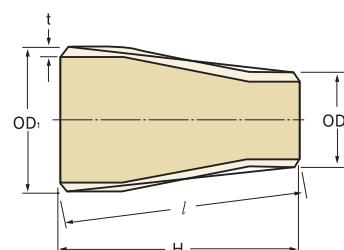
W = Weight(kg)

H = End to End (mm)

OD<sub>1</sub>= Large Size Outside Diameter (mm)

OD<sub>2</sub>= Small Size

t<sub>1</sub> = Wall Thickness (mm)



## 4. CAP

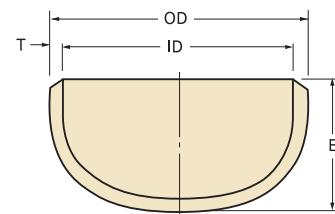
$$W = 7.85 \times \frac{\pi}{4} (OD+E)^2 \times T \times 10^{-6}$$

W = Weight(kg)

OD = Outside Diameter (mm)

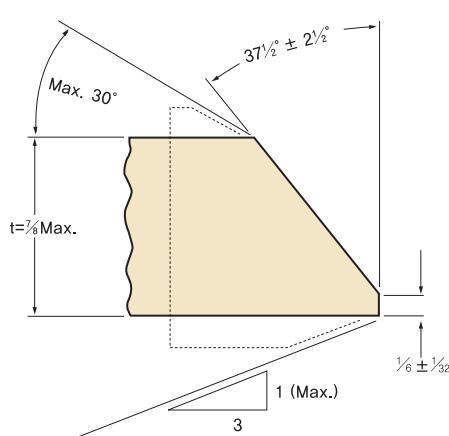
T = Wall Thickness (mm)

E = End to End (mm)

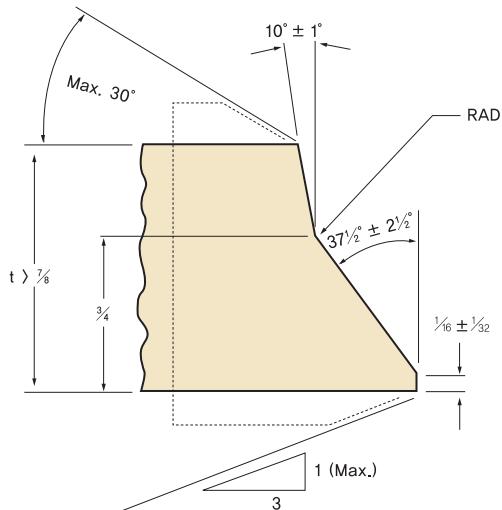


# WELDING END PREPARATIONS

- ASME B16.9



(a) Plain Bevel

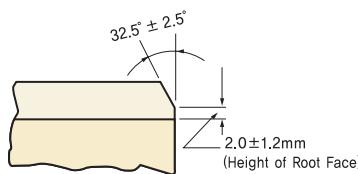


(b) Compound Bevel

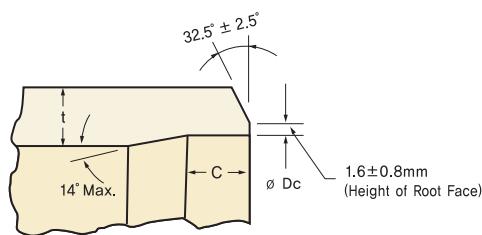
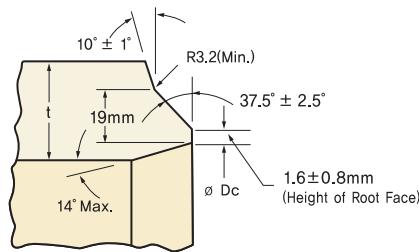
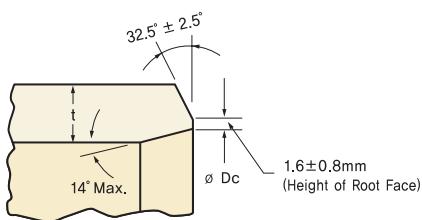
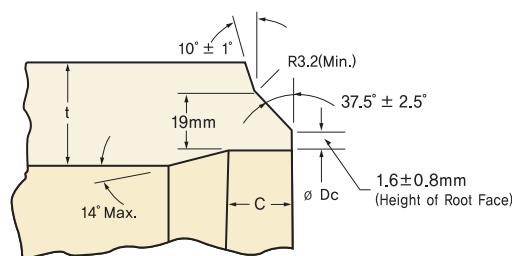
Nominal Pipe Wall Thickness (t)	End Preparation
Less than X*	Cut square or slightly chamfer, at mfr's. option
X* to 7/8 Inch	Plain bevel as in sketch "a" above
More than 7/8	Compound bevel as in sketch "b" above

X\* = 3/16 for carbon steel, ferritic alloy steel or wrought iron;  
1/8 for austenitic alloy steel

- Notes : 1. End preparations are in accordance with ANSI B16.25 Paragraph 4.2
- 2. End preparations conforming to customer specifications will be specially manufactured upon consultation.

**• KS/JIS**
**1. Steel Butt-Welding Pipe Fittings for Ordinary Use.**

{KS B1522}  
{JIS B2311}

**2. Steel Butt-Welding Pipe Fittings for Special Use.**

A: In the Case Where  $t$  is 19mm or Less

B: In the Case Where  $t$  is Over 19mm

C: In the Case Where  $t$  is 19mm or Less

D: In the Case Where  $t$  is Over 19mm

Where  $t$  : nominal wall thickness

Dc : diameter of machining bore

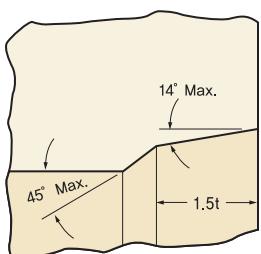
C : length of machining bore

**• Remarks**

- Diameter (Dc) and length (C) of machining bore and dimensional tolerances shall be as agreed between parties concerned.
- Relieving of machining bore may be performed by providing an inclination of 14° or less from the end face to the limits of 1.5 times the wall thickness, or after cutting to the cylindrical surface to the length of machining bore, providing an inclination of 14° or less to the limits above-indicated, and beyond that portion machining with an inclination of 45° or less.

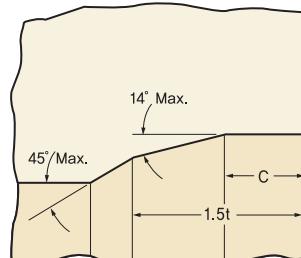
# WELDING END PREPARATIONS

For Types A and B of Bevel Shape



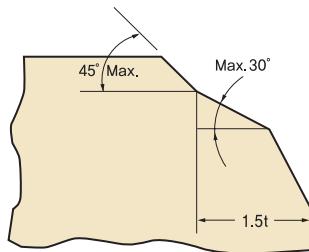
In the figure,  
t : nominal wall thickness

For Types C and D of Bevel Shape



In the figure,  
t : nominal wall thickness  
c : length of machining bore

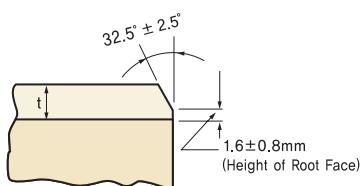
Relieving for outside diameter may be performed by providing an inclination of 30° or less from the end face to the limits of 1.5 times the wall thickness, and beyond that portion machining with an inclination of 45° or less.



In the figure,  
t : nominal wall thickness

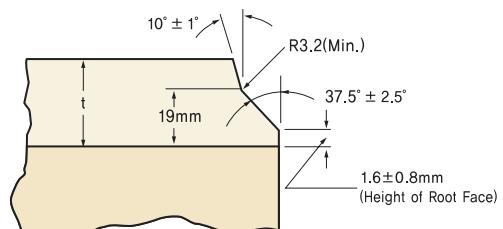
## 3. Steel Plate Butt-Welding Pipe Fittings

Where.  $t \leq 22.2$  mm



{KS B1543}  
{JIS B2313}

Where.  $t > 22.2$  mm



- Remarks : The shape and dimensions of the special bevel ends are referred to the reference clause stated in KS B1541, JIS B2312.

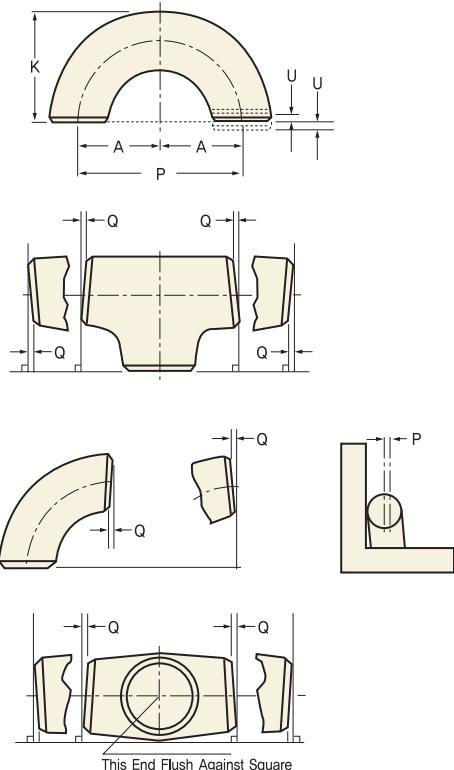
# DIMENSIONAL TOLERANCES

**MSB** (주)엠에스밴드 

## • ASME B16.9 & 16.28

### 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				
½ ~ 2½	+0.06 -0.03	±0.03	Not less than 87½% of nominal thickness	±0.06	±0.06	±0.06	±0.12	±0.25	±0.25	±0.03				
3 ~ 4	±0.06	±0.06												
5 ~ 8	+0.09 -0.06	±0.06												
10 ~ 18	+0.16 -0.12	±0.12					±0.25	±0.25	±0.25	±0.06				
20 ~ 24	+0.25 -0.19	±0.19												
26 ~ 30		±0.19					±0.38	-	-					
32 ~ 48														



Nominal Pipe Size	Angularity Tolerance	
	Off Angle Q	Off Plane P
½ ~ 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	0.5	
44 ~ 48	0.75	

• Dimensions are in inches.

# DIMENSIONAL TOLERANCES

## 2. Forged Socket Welding Fittings

Nominal Pipe Size	All Fittings				Center to Bottom of Socket	Bottom to Bottom of Socket	Bottom of Socket to Opposite Face
	Socket Bore Dia	Bore Dia. Of Fitting	Concentricity of Bore	Concidence of Axis			
$\frac{1}{8} \sim \frac{1}{4}$	+0.012 -0.000	$\pm 0.03$	Socket and Fitting Bores within $\pm 0.030$	Maximum variation in alignment of socket and fitting bores for $\frac{1}{8}$ in 12	$\pm 0.03$	$\pm 0.06$	$\pm 0.03$
$\frac{3}{8} \sim \frac{3}{4}$	+0.012 -0.000	$\pm 0.03$			$\pm 0.06$	$\pm 0.12$	$\pm 0.06$
1 ~ 2	+0.012 -0.000	$\pm 0.03$			$\pm 0.08$	$\pm 0.16$	$\pm 0.08$
$2\frac{1}{2} \sim 3$	+0.012 -0.000	$\pm 0.06$			$\pm 0.10$	$\pm 0.20$	$\pm 0.10$

- Dimensions are in inches.
- Above table is followed accordingly to ANSI B16.11

## • MSS SP-43

Nominal Pipe Size	All Fittings		90° Elbow 45° Elbow Tee	Reducer Lap Joint Stub End	180° Return		
	Outside(1) Diameter at Welding End	Wall Thickness	Center-to-End Dimension A, B, C, M	Overall Length F, H	Center-to-Center Dimension O	Center-to-Center Dimension K	Alignment of Ends U
½ ~ 1½	±0.03	Not less than 87½% of nominal thickness	±0.06	±0.06	±0.25	±0.25	±0.03
2 ~ 3½	±0.03		±0.06	±0.06	±0.25	±0.25	±0.03
4	±0.03		±0.06	±0.06	±0.25	±0.25	±0.03
5 ~ 8	+0.06 -0.03		±0.06	±0.06	±0.25	±0.25	±0.03
10 ~ 18	+0.09 -0.03		±0.09	±0.09	±0.38	±0.25	±0.06
20 ~ 24	+0.012 -0.03		±0.09	±0.09	±0.38	±0.25	±0.06

Nominal Pipe Size	All Fittings		Cap	Lap Joint Stub End	
	Outside(1) Diameter at Welding End	Wall Thickness	Overall Length E	Fillet(2) Radius of Lap A	Outside Diameter of Lap G
½ ~ 1½	±0.03	Not less than 87½% of nominal thickness	±0.12	+3 -0.03	+0 -0.03
2 ~ 3½	±0.03		±0.12	+0 -0.03	+0 -0.03
4	±0.03		±0.12	+0 -0.06	+0 -0.03
5 ~ 8	+0.06 -0.03		±0.25	+0 -0.06	+0 -0.03
10 ~ 18	+0.09 -0.03		±0.25	+0 -0.06	+0 -0.06
20 ~ 24	+0.012 -0.03		±0.25	+0 -0.06	+0 -0.06

• Dimensions are in inches.

Notes:

- Out of roundness is the vector sum of the plus and minus tolerance.
- Fillet B radius is the maximum

# DIMENSIONAL TOLERANCES

## • KS / JIS

### 1. Steel Butt-Welding Pipe Fittings for Ordinary Use

{KS B1522}  
JIS B2311}

Item	Type of Pipe Fitting	Nominal Diameter						
		1/2 ~ 2 1/2	3 ~ 4	5 ~ 8	10 ~ 18	20		
Tolerance								
Outside Dia, at end face (OD)	All pipe Fitting	±2	±2.5	±3.5	+5 -4.5	+6.4 -4.8		
Inside Dia, at end face (ID)		±2	±2.5	±3.5	±4.5	±4.8		
Wall thickness (T)		+Not specified -15%						
Centre-to-end dimension (A,B)	90° Elbow 45° Elbow	±2.0		±3.2		±4.8		
Centre-to-centre dimension (P)	180° Elbow	±6.4		±9.5		-		
Back-to-face dimension (K)		±6.4						
Alignment of ends(Max) (U)		1.6	3.2		-			
End-to-end dimension (H)	Reducer	±2.0		±3.2				
Centre-to-end dimension (C,M)	Tee	±2.0		±3.2				
Back-to-face dimension (E)	CAP	±3.2		±6.4				

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

{KS B1541, JIS B 2312}  
{KS B1543, 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 Dia, at end face (OD)	All pipe Fitting	+1.6 -0.8	±1.6	+2.4 -1.6	+4 -3.2	-				
Inside Dia, at end face (ID)		±0.8	±1.6		±3.2	±4.8				
Wall thickness (T)		+Not specified -12.5%					-			
Centre-to end dimension (A,B)	90° Elbow 45° Elbow	±1.6		±2.4		±3.2	±4.8			
Centre-to-centre 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			±4.8		
Centre-to-end dimension (C,M)	Tee	±1.6	±2.4		±3.2	±4.8				
Back-to-face dimension (E)	CAP	±3.2	±6.4		-					
Outside of end Peripheral length	All pipe Fitting	-					±0.5			

\*Application of KS B 1541, JIS B 2312

\*\*Application of KS B 1543 JIS B 2313

• Dimensions are in millimeters.

{KS B1542}  
JIS B2316}

### 3. Steel Socket-Wedging Pipe Fittings for Special

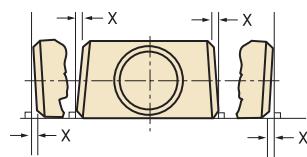
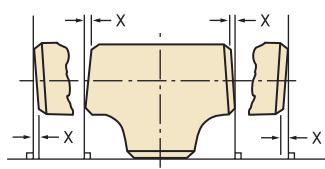
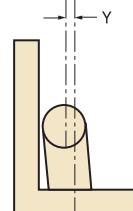
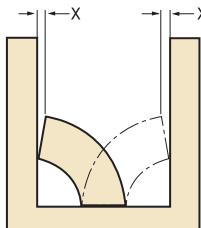
Item	Type of Pipe Fitting	Nominal Diameter			
		1/8 and 1/4	3/8 to 3/4	1 to 2	2 1/2 and 3
Tolerance					
Inside Diameter of Socket	All pipe Fittings		+0.3 0		+4 0
Bore diameter			±0.4		±0.8
Eccentricity of inside Diameter of socket to bare diameter			±0.8		
Inclination of socket hole to fitting bone axis			1.5/300Max.		
Distance from centre to bottom of socket	45° Elbow 90° Elbow cross	±0.8	±1.5	±2	±2.5
Laying length	Full coupling	±1.5	±3	±4	±5
Laying length	Half coupling	±0.8	±1.5	±2	±2.5

{KS B1522, JIS B 2311}  
KS B1541, JIS B 2312  
KS B1543, JIS B 2313}

### 4. Right Angel 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)	All pipe Fitting	0.8	1.6		2.4	3.2		4.8	
Off Plane(Y)		1.6	3.2	4.8	6.4		9.5	12.7	19.1

• Dimensions are in millimeters.



# BUTT-WELDING FITTINGS APPROX WEIGHT

## • 90° Elbows

Unit : kg

Nominal Pipe Size	Long							Short							Nominal Pipe Size
	SGP	STD	S 40	X-S	S 80	XX-S	S 160	SGP	STD	S 40	X-S	S 80	XX-S	S 160	
½	0.08	0.08	0.08	0.10	0.10	0.15	0.12	-	-	-	-	-	-	-	½
¾	0.10	0.11	0.11	0.14	0.14	0.22	0.13	-	-	-	-	-	-	-	¾
1	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	1
1¼	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	1¼
1½	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	0.43	1½
2	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	2
2½	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	2½
3	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	3
4	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	4
5	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	5
6	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	6
8	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	8
10	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	10
12	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	12
14	56.70	67.90	79.10	89.90	133.00	-	236.00	37.80	45.30	53.00	60.00	89.00	-	158.00	14
16	74.30	89.00	118.00	118.00	195.00	-	350.00	49.50	59.10	79.00	78.30	130.00	-	234.00	16
18	94.20	113.00	169.00	150.00	275.00	-	495.00	62.80	75.30	113.00	99.90	183.00	-	330.00	18
20	116.00	140.00	220.00	186.00	373.00	-	676.00	77.70	93.10	147.00	124.00	249.00	-	451.00	20
22	141.00	169.00	267.00	225.00	493.00	-	886.00	94.10	113.00	178.00	150.00	329.00	-	591.00	22
24	168.00	202.00	366.00	268.00	636.00	-	1160.00	112.00	135.00	244.00	179.00	424.00	-	773.00	24
26	198.00	237.00	430.00	315.00	-	-	132.00	158.00	287.00	210.00	-	-	-	26	
28	230.00	276.00	500.00	367.00	-	-	154.00	184.00	334.00	245.00	-	-	-	28	
30	264.00	316.00	575.00	421.00	-	-	176.00	211.00	383.00	281.00	-	-	-	30	
32	301.00	361.00	654.00	480.00	-	-	201.00	241.00	436.00	320.00	-	-	-	32	
34	340.00	408.00	739.00	543.00	-	-	227.00	272.00	493.00	362.00	-	-	-	34	
36	380.00	457.00	904.00	608.00	-	-	253.00	304.00	603.00	405.00	-	-	-	36	
38	425.00	510.00	-	679.00	-	-	283.00	340.00	-	453.00	-	-	-	38	
40	471.00	565.00	-	753.00	-	-	314.00	377.00	-	502.00	-	-	-	40	
42	518.00	622.00	-	828.00	-	-	346.00	416.00	-	554.00	-	-	-	42	
44	570.00	684.00	-	912.00	-	-	380.00	456.00	-	608.00	-	-	-	44	
46	623.00	748.00	-	997.00	-	-	415.00	499.00	-	665.00	-	-	-	46	
48	677.00	814.00	-	1085.00	-	-	452.00	543.00	-	724.00	-	-	-	48	
50	735.00	884.00	-	1178.00	-	-	490.00	589.00	-	786.00	-	-	-	50	
52	796.00	956.00	-	1305.00	-	-	530.00	637.00	-	870.00	-	-	-	52	
54	857.00	1031.00	-	1375.00	-	-	572.00	688.00	-	917.00	-	-	-	54	
56	926.00	1109.00	-	1480.00	-	-	616.00	740.00	-	976.00	-	-	-	56	
58	991.00	1190.00	-	1588.00	-	-	661.00	794.00	-	1059.00	-	-	-	58	
60	1060.00	1274.00	-	1700.00	-	-	707.00	849.00	-	1133.00	-	-	-	60	

## • 45° Elbows

Unit : kg

Nominal Pipe Size	Long						
	SGP	STD	S 40	X-S	S 80	XX-S	S 160
½	0.04	0.04	0.04	0.05	0.05	-	-
¾	0.05	0.06	0.06	0.07	0.07	-	-
1	0.08	0.08	0.08	0.10	0.10	0.18	0.13
1¼	0.13	0.13	0.13	0.18	0.18	0.32	0.21
1½	0.18	0.19	0.19	0.25	0.25	0.47	0.33
2	0.32	0.33	0.33	0.45	0.45	0.85	0.67
2½	0.60	0.69	0.69	0.90	0.90	1.72	1.17
3	0.79	1.02	1.02	1.37	1.37	2.63	1.92
4	1.46	1.92	1.92	2.68	2.68	5.09	4.01
5	2.25	3.24	3.24	4.57	4.57	8.80	7.35
6	3.55	4.97	4.97	7.50	7.50	1.72	12.10
8	7.20	10.10	10.10	15.30	15.30	2.63	26.60
10	12.70	17.70	17.70	23.90	28.50	5.09	51.50
12	19.00	26.00	28.50	34.40	47.00	8.80	85.50
14	28.40	34.00	40.10	45.00	66.50	14.50	118.00
16	37.20	44.50	59.00	59.00	97.50	25.70	175.00
18	47.10	56.50	84.50	75.50	138.00	41.00	247.00
20	58.30	70.00	110.00	93.00	187.00	65.00	338.00
22	70.50	84.50	-	113.00	257.00	-	443.00
24	84.10	101.00	183.00	134.00	318.00	-	580.00
26	99.00	119.00	-	158.00	-	-	-
28	115.00	138.00	-	184.00	-	-	-
30	132.00	158.00	-	211.00	-	-	-
32	150.00	180.00	-	327.00	240.00	-	-
34	170.00	204.00	-	369.00	272.00	-	-
36	190.00	228.00	-	452.00	304.00	-	-
38	212.00	255.00	-	339.00	-	-	-
40	235.00	282.00	-	376.00	-	-	-
42	259.00	311.00	-	414.00	-	-	-
44	285.00	342.00	-	456.00	-	-	-
46	312.00	374.00	-	498.00	-	-	-
48	339.00	407.00	-	542.00	-	-	-

## • CAP

Unit : kg

Nominal Pipe Size	SGP	STD	S 40	X-S	S 80	XX-S	S 160
	SGP	STD	S 40	X-S	S 80	XX-S	S 160
½	0.03	0.04	0.04	0.05	0.05	0.05	0.06
¾	0.04	0.05	0.05	0.07	0.07	0.07	0.09
1	0.08	0.11	0.11	0.15	0.15	0.15	0.20
1¼	0.11	0.14	0.14	0.20	0.20	0.39	0.25
1½	0.15	0.17	0.17	0.24	0.24	0.50	0.35
2	0.23	0.24	0.24	0.33	0.33	0.68	0.54
2½	0.34	0.42	0.42	0.57	0.57	1.33	0.77
3	0.51	0.67	0.67	0.92	0.92	2.18	1.40
4	0.88	1.17	1.17	1.68	1.68	3.80	2.76
5	1.29	1.90	1.90	2.73	2.73	6.22	4.85
6	1.99	2.83	2.83	4.38	4.38	9.85	7.81
8	3.61	5.11	5.11	7.91	7.91	16.40	15.20
10	6.33	8.92	8.92	12.20	12.20	28.35	28.90
12	9.43	13.10	13.10	17.40	17.40	39.40	47.70
14	13.20	15.90	18.60	21.20	21.20	34.90	61.20
16	16.60	20.00	26.70	26.70	49.00	-	92.80
18	21.20	25.50	41.50	34.10	69.00	-	131.00
20	26.40	31.80	54.10	42.50	93.70	-	179.00
22	31.50	38.80	61.40	51.70	116.00	-	219.00
24	36.60	45.10	90.10	60.10	160.00	-	307.00
26	41.00	50.50	92.30	67.30	-	-	-
28	45.50	56.20	103.00	74.90	-	-	-
30	50.30	62.10	114.00	82.80	-	-	-
32	55.40	68.40	126.00	91.20	-	-	-
34	62.30	75.40	138.00	100.00	-	-	-
36	68.00	81.90	164.00	109.00	-	-	-
38	79.00	94.70	-	126.00	-	-	

**• Tee**

Unit : kg

Nominal Pipe Size	SGP	STD	S 40	X-S	S 80	XX-S	S 160	Nominal Pipe Size	SGP	STD	S 40	X-S	S 80	XX-S	S 160
1/2 × 1/2	0.09	0.09	0.09	0.11	0.11	0.17	0.12	18×18	70.00	83.90	125.00	111.00	204.00	-	356.00
3/4 × 3/4	0.13	0.13	0.13	0.17	0.17	0.26	0.21	18×16	67.90	81.40	121.00	108.00	197.00	-	352.00
3/4 × 1/2	0.12	0.12	0.12	0.16	0.16	0.24	0.19	18×14	66.90	80.20	119.00	106.00	194.00	-	344.00
1 × 1	0.24	0.25	0.25	0.32	0.32	0.53	0.41	18×12	65.40	78.30	117.00	104.00	189.00	-	337.00
1 × 3/4	0.23	0.24	0.24	0.30	0.30	0.49	0.38	18×10	63.40	76.90	114.00	102.00	186.00	-	329.00
1 × 1/2	0.22	0.23	0.23	0.29	0.29	0.47	0.37	20×20	86.60	104.00	163.00	138.00	277.00	-	502.00
1 1/4 × 1 1/4	0.42	0.43	0.43	0.56	0.56	0.95	0.69	20×18	84.20	101.00	158.00	134.00	268.00	-	488.00
1 1/4 × 1	0.39	0.40	0.40	0.53	0.53	0.89	0.65	20×16	82.10	98.40	154.00	131.00	262.00	-	475.00
1 1/4 × 3/4	0.37	0.37	0.37	0.48	0.48	0.84	0.62	20×14	81.10	97.20	152.00	129.00	258.00	-	469.00
1 1/4 × 1/2	0.36	0.36	0.36	0.47	0.47	0.81	0.59	20×12	79.20	96.00	150.00	127.00	254.00	-	462.00
1 1/2 × 1 1/2	0.58	0.61	0.61	0.81	0.81	1.40	1.07	20×10	77.60	94.00	147.00	125.00	250.00	-	452.00
1 1/2 × 1 1/4	0.56	0.59	0.59	0.78	0.78	1.35	1.01	20×8	76.30	92.10	145.00	123.00	245.00	-	444.00
1 1/2 × 1	0.53	0.56	0.56	0.74	0.74	1.28	0.97	22×22	106.00	126.00	198.00	167.00	365.00	-	657.00
1 1/2 × 3/4	0.51	0.53	0.53	0.70	0.70	1.21	0.92	22×20	103.00	123.00	193.00	163.00	356.00	-	640.00
1 1/2 × 1/2	0.49	0.51	0.51	0.67	0.67	1.17	0.90	22×18	101.00	120.00	188.00	159.00	347.00	-	624.00
2 × 2	0.86	0.88	0.88	1.20	1.20	2.16	1.78	22×16	98.90	117.00	183.00	156.00	340.00	-	610.00
2 × 1 1/2	0.80	0.82	0.82	1.11	1.11	2.00	1.63	24×24	116.00	139.00	252.00	185.00	438.00	-	800.00
2 × 1 1/4	0.77	0.79	0.79	1.07	1.07	1.91	1.56	24×22	115.00	138.00	249.00	183.00	432.00	-	790.00
2 × 1	0.73	0.75	0.75	1.01	1.01	1.81	1.50	24×20	114.00	136.00	247.00	181.00	427.00	-	782.00
2 × 3/4	0.70	0.71	0.71	0.98	0.98	1.76	1.45	24×18	111.00	133.00	241.00	177.00	418.00	-	764.00
2 1/2 × 2 1/2	1.42	1.74	1.74	2.28	2.28	3.92	2.86	26×26	147.00	176.00	319.00	234.00	-	-	-
2 1/2 × 2	1.31	1.56	1.56	2.06	2.06	3.56	2.64	26×24	144.00	172.00	312.00	229.00	-	-	-
2 1/2 × 1 1/2	1.25	1.51	1.51	1.98	1.98	3.40	2.48	26×22	141.00	169.00	308.00	225.00	-	-	-
2 1/2 × 1 1/4	1.22	1.48	1.48	1.94	1.94	3.32	2.42	26×20	138.00	166.00	302.00	221.00	-	-	-
2 1/2 × 1	1.18	1.36	1.36	1.80	1.80	3.22	2.36	28×28	165.00	198.00	359.00	264.00	-	-	-
3 × 3	1.87	2.41	2.41	3.25	3.25	5.90	4.55	28×26	163.00	197.00	356.00	261.00	-	-	-
3 × 2 1/2	1.79	2.29	2.29	3.07	3.07	5.53	4.23	28×24	160.00	193.00	350.00	256.00	-	-	-
3 × 2	1.68	2.12	2.12	2.85	2.85	5.18	4.02	28×22	157.00	190.00	347.00	252.00	-	-	-
3 × 1 1/2	1.62	2.06	2.06	2.77	2.77	5.03	3.87	30×30	190.00	228.00	414.00	304.00	-	-	-
3 × 1 1/4	1.60	2.02	2.02	2.74	2.74	4.95	3.80	30×28	188.00	226.00	406.00	301.00	-	-	-
4 × 4	3.13	4.12	4.12	5.77	5.77	10.60	8.50	30×26	185.00	222.00	356.00	296.00	-	-	-
4 × 3	2.92	3.83	3.83	5.33	5.33	9.76	7.92	30×24	182.00	218.00	350.00	291.00	-	-	-
4 × 2 1/2	2.84	3.71	3.71	5.15	5.15	9.39	7.56	32×32	217.00	259.00	474.00	347.00	-	-	-
4 × 2	2.72	3.53	3.53	4.94	4.94	9.02	7.34	32×30	213.00	256.00	466.00	341.00	-	-	-
4 × 1 1/2	2.66	3.48	3.48	4.83	4.83	8.87	7.23	32×28	209.00	252.00	458.00	335.00	-	-	-
5 × 5	4.53	6.54	6.54	9.20	9.20	17.30	14.80	32×26	208.00	250.00	455.00	333.00	-	-	-
5 × 4	4.30	6.13	6.13	8.63	8.63	16.10	13.70	34×34	246.00	295.00	535.00	393.00	-	-	-
5 × 3	4.08	5.83	5.83	8.19	8.19	15.30	13.00	34×32	243.00	292.00	526.00	389.00	-	-	-
5 × 2 1/2	4.00	5.71	5.71	8.01	8.01	15.00	12.80	34×30	238.00	290.00	518.00	380.00	-	-	-
5 × 2	3.90	5.58	5.58	7.92	7.92	14.70	12.50	34×28	236.00	288.00	511.00	377.00	-	-	-
6 × 6	6.84	9.58	9.58	14.50	14.50	27.20	23.30	36×36	276.00	331.00	656.00	441.00	-	-	-
6 × 5	6.45	9.08	9.08	13.60	13.60	25.60	21.90	36×34	271.00	329.00	645.00	434.00	-	-	-
6 × 4	6.23	8.67	8.67	13.00	13.00	24.50	20.80	36×32	269.00	326.00	636.00	431.00	-	-	-
6 × 3	6.01	8.38	8.38	12.60	12.60	23.70	20.10	36×30	264.00	323.00	627.00	422.00	-	-	-
6 × 2 1/2	5.92	8.36	8.36	12.50	12.50	23.30	19.80	38×38	308.00	370.00	-	493.00	-	-	-
8 × 8	12.80	17.90	17.90	27.10	27.10	45.70	47.20	38×36	306.00	367.00	-	489.00	-	-	-
8 × 6	11.90	16.60	16.60	25.20	25.20	43.00	43.50	38×34	302.00	362.00	-	481.00	-	-	-
8 × 5	11.50	16.10	16.10	24.30	24.30	41.40	42.10	38×32	298.00	357.00	-	476.00	-	-	-
8 × 4	11.30	15.70	15.70	23.70	23.70	41.00	40.30	40×40	342.00	411.00	-	547.00	-	-	-
10 × 10	21.80	30.40	30.40	41.00	49.00	79.20	88.00	40×38	340.00	408.00	-	543.00	-	-	-
10 × 8	20.40	28.50	28.50	38.90	45.80	54.40	81.40	40×36	335.00	402.00	-	536.00	-	-	-
10 × 6	19.50	27.20	27.20	37.00	43.90	71.50	78.50	40×34	331.00	397.00	-	529.00	-	-	-
10 × 5	19.20	26.80	26.80	36.20	43.10	70.00	77.00	42×42	352.00	422.00	-	562.00	-	-	-
10 × 4	18.90	26.80	26.80	36.20	42.50	68.90	76.30	42×40	350.00	420.00	-	559.00	-	-	-
12 × 12	32.00	43.60	48.70	57.70	79.20	113.00	143.00	42×38	348.00	418.00	-	557.00	-	-	-
12 × 10	30.40	41.60	45.30	55.20	74.80	107.00	135.00	42×36	346.00	416.00	-	554.00	-	-	-
12 × 8	29.00	39.70	42.50	53.10	71.40	102.00	128.00	44×44	396.00	475.00	-	633.00	-	-	-
12 × 6	28.10	38.40	42.00	51.20	69.50	100.00	125.00	44×42	394.00	473.00	-	630.00	-	-	-
12 × 5	27.80	38.70	41.70	51.20	68.70	98.30	124.00	44×40	389.00	467.00	-	623.00	-	-	-
14 × 14	44.70	53.50	62.40	70.90	104.00	-	186.00	44×38	385.00	462.00	-	616.00	-	-	-
14 × 12	42.70	51.90	60.20	68.80	100.00	-	179.00	44×36	434.00	521.00	-	695.00	-	-	-
14 × 10	41.20	49.90	57.60	66.30	95.90	-	174.00	44×34	432.00	519.00	-	691.00	-	-	-
14 × 8	40.00	48.20	55.80	64.50	92.90	-	168.00	46×46	427.00	513.00	-	683.00	-	-	-
14 × 6	39.00	47.10	54.50	62.60	91.00	-	164.00	46×44	427.00	507.00	-	676.00	-	-	-
16 × 16	55.20	66.10	88.00	87.70	145.00	-	260.00	48×48	474.00	569.00	-	759.00	-	-	-
16 × 14	54.20	64.90	86.00	86.10	140.00	-	255.00	48×46	472.00	566.00	-	755.00	-	-	-
16 × 12	52.70	63.10	84.00	83.60	136.00	-	248.00	48×44	470.00	564.00	-	751.00	-	-	-
16 × 10	51.20	61.30	82.00	81.20	132.00	-	241.00	48×42	462.00	555.00	-	739.00	-	-	-
16 × 8	49.40	59.80	79.00	80.00	129.00	-	235.00								
16 × 6	48.50	58.50	77.00	77.80	127.00	-	230.00								

# BUTT-WELDING FITTINGS APPROX WEIGHT

## • REDUCER

Nominal Pipe Size	SGP	STD	S 40	X-S	S 80	XX-S	S 160
¾ × ½	0.06	0.06	0.06	0.08	0.08	-	-
1 × ¾	0.11	0.12	0.12	0.15	0.15	0.25	0.19
1 × ½	0.10	0.11	0.11	0.14	0.14	0.22	0.17
1½ × 1	0.16	0.16	0.16	0.21	0.21	0.35	0.25
1½ × ¾	0.15	0.15	0.15	0.19	0.19	0.31	0.23
1½ × ½	0.13	0.14	0.14	0.18	0.18	-	-
1½ × 1¼	0.24	0.25	0.25	0.33	0.33	0.57	0.43
1½ × 1	0.21	0.22	0.22	0.30	0.30	0.50	0.38
1½ × ¾	0.20	0.21	0.21	0.27	0.27	0.45	0.35
1½ × ½	0.18	0.18	0.18	0.24	0.24	0.40	0.32
2 × 1½	0.37	0.38	0.38	0.51	0.51	0.91	0.75
2 × 1¼	0.35	0.36	0.36	0.48	0.48	0.85	0.70
2 × 1	0.31	0.33	0.33	0.44	0.44	0.77	0.64
2 × ¾	0.29	0.30	0.30	0.40	0.40	0.69	0.58
2½ × 2	0.60	0.73	0.73	0.95	0.95	1.68	1.20
2½ × 1½	0.55	0.67	0.67	0.87	0.87	1.51	1.08
2½ × 1¼	0.52	0.64	0.64	0.83	0.83	1.42	1.02
2½ × 1	0.48	0.56	0.56	0.73	0.73	1.23	0.93
3 × 2½	0.73	0.94	0.94	1.25	1.25	2.25	1.71
3 × 2	0.66	0.85	0.85	1.13	1.13	2.01	1.57
3 × 1½	0.62	0.79	0.79	1.04	1.04	1.83	1.44
3 × 1¼	0.59	0.75	0.75	1.00	1.00	1.74	1.37
4 × 3	1.10	1.45	1.45	2.02	2.01	3.65	3.00
4 × 2½	1.04	1.37	1.37	1.90	1.90	3.41	2.76
4 × 2	0.97	1.27	1.27	1.76	1.76	3.11	2.58
4 × 1½	0.91	1.19	1.19	1.64	1.64	2.89	2.41
5 × 4	1.74	2.50	2.50	3.52	3.52	6.47	5.59
5 × 3	1.58	2.27	2.27	3.18	3.18	5.78	5.30
5 × 2½	1.50	2.16	2.16	3.02	3.02	5.46	4.70
5 × 2	1.41	2.03	2.03	2.85	2.85	5.12	4.43
6 × 5	2.55	3.57	3.57	5.38	5.38	9.89	8.63
6 × 4	2.36	3.30	3.30	4.96	4.96	8.98	7.88
6 × 3	2.18	3.04	3.04	4.56	4.56	8.21	7.21
6 × 2½	2.09	2.94	2.94	4.38	4.38	7.88	6.80
8 × 6	4.17	5.71	5.71	8.63	8.63	14.30	15.00
8 × 5	3.87	5.40	5.40	8.14	8.14	13.40	14.00
8 × 4	3.67	5.10	5.10	7.68	7.68	12.60	13.10
10 × 8	6.87	9.58	9.58	12.90	15.40	24.30	27.50
10 × 6	6.32	8.78	8.78	11.80	14.20	22.10	25.10
10 × 5	6.06	8.42	8.42	11.30	14.50	21.10	23.90
10 × 4	5.80	8.20	8.20	11.00	14.00	20.50	22.60
12 × 10	9.97	13.60	14.70	18.00	24.80	35.00	44.60
12 × 8	9.29	12.70	13.70	16.70	22.70	33.00	41.00
12 × 6	8.69	11.80	12.80	15.60	21.40	32.00	38.00
12 × 5	8.39	11.70	12.60	15.30	20.60	31.00	36.40
14 × 12	21.20	25.40	29.50	33.60	49.80	-	88.50
14 × 10	19.70	23.60	27.40	31.20	46.10	-	81.60
14 × 8	18.30	21.80	25.40	28.90	42.20	-	74.70
14 × 6	16.90	20.30	23.60	26.80	39.10	-	68.30
16 × 14	25.90	31.00	41.10	41.10	67.70	-	121.00
16 × 12	24.10	29.60	39.20	39.20	65.00	-	116.00
16 × 10	22.40	27.80	36.80	36.80	60.80	-	108.00
16 × 8	21.70	26.20	34.50	34.50	56.60	-	99.90
18 × 16	31.50	37.80	56.20	50.10	91.40	-	165.00
18 × 14	29.80	35.70	53.00	47.40	86.40	-	155.00
18 × 12	27.70	33.20	51.70	44.00	83.00	-	149.00
18 × 10	27.10	32.70	48.40	43.20	78.50	-	140.00
20 × 18	47.00	56.40	88.40	74.90	150.00	-	-
20 × 16	44.70	53.50	83.90	71.10	142.00	-	-
20 × 14	42.40	50.80	79.60	67.40	136.00	-	233.00
20 × 12	40.80	49.20	76.90	65.10	130.00	-	-

Nominal Pipe Size	SGP	STD	S 40	X-S	S 80	XX-S	S 160	Unit : kg
22 × 20	52.10	62.40	98.00	82.90	181.00	-	-	
22 × 18	49.50	59.40	93.20	78.90	172.00	-	-	
22 × 16	47.00	56.40	88.40	74.80	164.00	-	-	
22 × 14	45.30	54.30	83.60	72.10	156.00	-	-	
24 × 22	57.10	68.40	124.00	91.00	215.00	-	-	
24 × 20	54.80	65.70	119.00	87.30	206.00	-	-	
24 × 18	52.60	63.00	114.00	83.80	197.00	-	-	
24 × 16	50.40	60.50	109.00	80.30	185.00	-	-	
26 × 24	74.50	89.40	162.00	119.00	-	-	-	
26 × 22	71.50	85.80	155.00	114.00	-	-	-	
26 × 20	68.50	82.10	148.00	109.00	-	-	-	
26 × 18	66.30	79.50	142.00	106.00	-	-	-	
28 × 26	80.60	96.60	175.00	129.00	-	-	-	
28 × 24	77.50	93.00	168.00	124.00	-	-	-	
28 × 22	74.50	89.40	162.00	119.00	-	-	-	
28 × 20	72.40	86.80	155.00	115.00	-	-	-	
30 × 28	86.60	104.00	188.00	138.00	-	-	-	
30 × 26	83.60	100.00	182.00	133.00	-	-	-	
30 × 24	80.60	96.60	175.00	129.00	-	-	-	
30 × 22	78.50	94.20	168.00	125.00	-	-	-	
32 × 30	92.60	111.00	202.00	148.00	-	-	-	
32 × 28	89.60	108.00	195.00	143.00	-	-	-	
32 × 26	86.60	104.00	188.00	138.00	-	-	-	
32 × 24	84.60	102.00	184.00	135.00	-	-	-	
34 × 32	98.70	118.00	215.00	158.00	-	-	-	
34 × 30	95.60	115.00	208.00	153.00	-	-	-	
34 × 28	92.60	111.00	205.00	148.00	-	-	-	
34 × 26	90.70	109.00	200.00	145.00	-	-	-	
36 × 34	104.60	125.60	250.00	167.30	-	-	-	
36 × 32	101.60	122.00	243.00	162.40	-	-	-	
36 × 30	98.60	118.40	238.00	157.60	-	-	-	
36 × 28	95.60	114.70	234.00	152.80	-	-	-	
38 × 36	112.00	133.00	-	177.00	-	-	-	
38 × 34	108.00	129.00	-	172.00	-	-	-	
38 × 32	105.00	126.00	-	167.00	-	-	-	
38 × 30	103.00	124.00	-	165.00	-	-	-	
40 × 38	117.00	140.00	-	187.00	-	-	-	
40 × 36	114.00	137.00	-	182.00	-	-	-	
40 × 34	111.00	133.00	-	177.00	-	-	-	
40 × 32	109.00	131.00	-	174.00	-	-	-	
42 × 40	123.00	147.00	-	196.00	-	-	-	
42 × 38	120.00	144.00	-	192.00	-	-	-	
42 × 36	117.00	140.00	-	187.00	-	-	-	
42 × 34	115.00	138.00	-	184.00	-	-	-	
44 × 42	129.00	155.00	-	206.00	-	-	-	
44 × 40	126.00	151.00	-	201.00	-	-	-	
44 × 38	123.00	147.00	-	196.00	-	-	-	
44 × 36	121.00	146.00	-	194.00	-	-	-	
46 × 44	157.00	189.00	-	252.00	-	-	-	
46 × 42	154.00	185.00	-	246.00	-	-	-	
46 × 40	150.00	180.00	-	241.00	-	-	-	
46 × 38	148.00	178.00	-	237.00	-	-	-	
48 × 46	164.00	197.00	-	263.00	-	-	-	
48 × 44	161.00	193.00	-	257.00	-	-	-	
48 × 42	157.00	189.00	-	252.00	-	-	-	
48 × 40	155.00	186.00	-	248.00	-	-	-	

**• STAINLESS STEEL FITTINGS**

Unit : kg

Nominal Pipe Size	90° Elbow(L)			90° Elbow(S)			Tee			Reducer			Cap		
	S5s	S10s	S20s	S5s	S10s	S20s	S5s	S10s	S20s	S5s	S10s	S20s	S5s	S10s	S20s
1/2	0.05	0.06	0.07	-	-	-	0.05	0.07	0.08	-	-	-	0.02	0.03	0.03
3/4	0.05	0.06	0.09	-	-	-	0.07	0.10	0.11	0.03	0.04	0.05	0.03	0.04	0.04
1	0.08	0.13	0.14	0.05	0.08	0.09	0.12	0.20	0.22	0.06	0.09	0.10	0.05	0.09	0.10
1 1/4	0.12	0.20	0.22	0.08	0.13	0.15	0.20	0.33	0.36	0.07	0.12	0.13	0.07	0.11	0.12
1 1/2	0.17	0.28	0.30	0.11	0.19	0.20	0.30	0.46	0.50	0.11	0.18	0.20	0.08	0.13	0.14
2	0.29	0.47	0.59	0.19	0.31	0.39	0.38	0.63	0.79	0.16	0.27	0.34	0.10	0.17	0.21
2 1/2	0.55	0.79	0.94	0.37	0.52	0.63	0.71	1.00	1.18	0.30	0.43	0.50	0.16	0.23	0.28
3	0.81	1.16	1.51	0.54	0.77	1.00	0.96	1.38	1.78	0.37	0.52	0.69	0.25	0.37	0.48
4	1.40	2.00	2.60	0.93	1.33	1.74	1.50	2.15	2.80	0.56	0.80	1.04	0.41	0.59	0.78
5	2.83	3.46	4.97	1.89	2.31	3.31	2.85	3.48	5.01	1.09	1.33	1.92	0.81	0.99	1.44
6	4.06	4.96	7.09	2.71	3.31	4.73	3.89	4.75	6.83	1.46	1.78	2.55	1.13	1.39	1.99
8	7.07	9.55	15.90	4.71	6.37	10.70	6.26	8.43	14.30	2.01	2.72	4.56	1.76	2.38	4.05
10	13.50	16.60	25.00	9.01	11.10	16.70	11.50	14.20	21.50	3.66	4.49	6.77	3.35	4.13	6.23
12	22.40	25.80	35.70	15.00	17.20	23.90	18.80	21.60	30.20	5.88	6.78	9.40	5.54	6.39	8.89
14	28.80	34.60	56.90	19.20	23.10	37.80	22.70	27.30	44.80	10.80	13.00	21.20	6.62	7.99	13.20
16	39.80	45.30	74.50	26.50	30.20	49.50	29.60	33.70	55.20	13.90	15.80	25.90	8.82	10.10	16.70
18	50.40	57.40	94.50	33.60	38.30	62.80	37.40	42.70	70.00	17.20	19.20	29.80	11.30	12.90	21.30
20	71.00	82.10	142.00	47.30	54.70	95.00	52.80	61.00	104.00	28.60	33.10	56.00	16.00	18.50	31.80
22	85.90	99.50	170.00	57.30	66.30	114.00	63.80	74.10	126.20	31.70	36.70	62.50	19.50	22.60	38.80
24	118.00	136.00	202.00	79.00	90.40	135.00	81.40	93.90	139.40	40.20	46.00	68.60	26.20	30.10	45.10

**• LAP JOINT STUB-END**

Unit : kg

Type Size	ANSI			MSS			JIS				JPI			
	S5s	S10s	S40s	S5s	S10s	S40s	S5s	S10s	S20s	S40s	S5s	S10s	S20s	S40s
1/2	0.06	0.08	0.11	0.04	0.06	0.07	0.04	0.05	0.07	0.07	0.04	0.06	0.06	0.07
3/4	0.09	0.11	0.15	0.06	0.08	0.10	0.05	0.07	0.08	0.09	0.06	0.08	0.09	0.10
1	0.14	0.24	0.29	0.08	0.13	0.16	0.10	0.17	0.18	0.20	0.08	0.13	0.14	0.16
1 1/4	0.19	0.31	0.40	0.10	0.17	0.22	0.13	0.21	0.23	0.27	0.10	0.17	0.19	0.22
1 1/2	0.22	0.37	0.48	0.12	0.21	0.27	0.14	0.24	0.25	0.31	0.12	0.21	0.23	0.27
2	0.41	0.68	0.95	0.20	0.33	0.47	0.18	0.30	0.38	0.42	0.20	0.33	0.43	0.47
2 1/2	0.60	0.86	1.41	0.31	0.44	0.74	0.30	0.43	0.49	0.73	0.31	0.44	0.53	0.74
3	0.80	0.96	2.02	0.40	0.57	1.01	0.34	0.48	0.64	0.87	0.40	0.57	0.76	1.01
4	1.05	1.51	2.91	0.60	0.87	1.68	0.43	0.61	0.81	1.21	0.60	0.87	1.12	1.68
5	2.20	2.69	5.09	0.98	1.21	2.28	0.72	0.87	1.28	1.68	0.98	1.21	1.73	2.28
6	2.64	3.23	6.12	1.34	1.64	3.37	0.88	1.07	1.57	2.21	1.34	1.64	2.41	3.37
8	3.47	4.69	10.00	1.96	2.65	5.67	1.36	1.94	3.12	3.92	1.95	2.78	4.47	5.61
10	6.47	7.95	17.30	3.57	4.38	9.55	2.15	2.53	4.08	5.80	3.51	4.13	6.65	9.45
12	9.13	10.40	21.30	5.85	6.74	13.80	2.89	3.25	4.67	7.34	5.81	6.52	9.38	14.70
14	11.70	14.10	-	6.42	7.73	-	-	-	-	-	-	-	-	-
16	14.30	16.30	-	7.91	9.00	-	-	-	-	-	-	-	-	-
18	16.40	18.70	-	9.24	10.50	-	-	-	-	-	-	-	-	-
20	20.80	24.10	-	11.70	13.50	-	-	-	-	-	-	-	-	-
22	23.10	26.70	-	16.50	18.90	-	-	-	-	-	-	-	-	-
24	29.00	33.40	-	16.50	18.90	-	-	-	-	-	-	-	-	-

# COMPARISON OF ASTM SPECIFICATIONS AND SIMILAR

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
	WPB	A106-B	A515-60 or 70 A516-60 or 70	A105	HT38, HT38(W)	SPHT38	SBB42
	WPC	A106-C	A515-70 A516-70	A105	HT42, HT42(W)	SPHT42	SBB42
	WPL6	A333 and A334-6	A516-60	A350-LF2	HT49, HT49(W)	SPHT49	SBB49
Low Temperature Steel	WPL3	A333 and A334-3	A203-D	A350-LF3	PL39	SPHL39	SLAL39
	WPL9	A333 and A334-9	A203-A	A350-LF9	-	-	-
	WP1	A335-P1	A203-B	A182-F1	PA12, FA12	SPA12	SBB46M
Alloy Steel	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
	WP7	A335-P5	A387-5	A182-F5	PA25, FA25	SPA25	SCMV6
	WP5	A335-P7	A387-7	A182-F7	-	-	-
	WP9	A335-P9	A387-9	A182-F9	-	-	-
	WP91	A335-P91	A387-91	A182-F91	-	-	-
	WP304	A312-TP304	A240-Type 304	A182-F304	STS304, STS304W, STS304F	STS304TP	STS304
Stainless Steel	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	-

# STANDARDS

**MSB** (주)엠에스밴드 

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-Steel23	17175-ST35.8	Carbon Steel
PS410, PT410(W)	STPT410	SB42	3602-Steel27	17175-ST45.8	Carbon Steel
PS480, PT480(W)	STPT480	SB49	3602-Steel35	-	Carbon Steel
PL380(W)	STPL380	-	3603-Steel 27 LT 30	-	Carbon Steel
PL450(W)	STPL450	-	3603-Steel503 LT100	-	31/2 % Ni Steel
PL690(W)	STPL690	-	-	-	2% Ni-1% Cu Steel
PA12(W), FA12	STPA12	-	-	17175-15 Mo3	Cabon-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-HF622,27	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	SUS309TP	SUS309S	-	-	22% Cr-12% Ni Steel
SUS310S, SUS310SW, SUS310SF	SUS310TP	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, SUS34HF	SUS347HTP	-	3605-832Nb	-	18% Cr-8% Ni-Cb-Ta(0.04-0.10)% C Steel

# MATERIALS SPECIFICATIONS FOR BUTT-WELDING FITTINGS

Marking symbol	Materials	Form	Chemical Composition (Percent)						
			Max. or Range (Unless otherwise indicated)						
			C	Si	Mn	P	S	Ni	
A234 A10Y	CS	WPB	A160 Gr. B A515 Gr. 65 A515 Gr. 70	P PL PL	0.30 0.28-0.33 0.31-0.35	0.10 Min. 0.13-0.33 0.13-0.35	0.29-1.06 0.90 0.90	0.048 0.035 0.035	0.058 0.040 0.040
		WPC	A106 Gr. C A335 Gr. P1 A204 Gr. B	P P PL	0.35 0.10-0.20 0.20-0.27	0.10 Min. 0.10-0.50 0.13-0.32	0.29-1.06 0.30-0.80 0.90	0.048 0.045 0.035	0.058 0.055 0.040
		WP1	A335 Gr.P12 A387 Gr.12	P PL	0.15 0.17	0.50 0.13-0.32	0.30-0.61 0.36-0.69	0.045 0.035	0.055 0.040
		WP12	A335 Gr.P11 A387 Gr.11	P PL	0.15 0.17	0.50-1.00 0.44-0.86	0.30-0.60 0.36-0.69	0.030 0.035	0.030 0.040
		WP11	A335 Gr.P22 A387 Gr.22	P PL	0.15 0.15-0.17	0.50 0.50	0.30-0.60 0.27-0.63	0.030 0.035	0.030 0.035
		WP22	A335 Gr.P5 A387 Gr.5	P PL	0.15 0.15	0.50 0.50	0.30-0.60 0.27-0.63	0.030 0.040	0.030 0.030
		WP5	A335 Gr.9 A387 Gr.9	P PL	0.15 0.15	0.25-1.00 1.00	0.30-0.60 0.30-0.60	0.025 0.030	0.025 0.030
		WP9	A335 Gr.91 A387 Gr.91	P PL	0.08-0.12 0.08-0.12	0.20-0.50 0.20-0.50	0.30-0.60 0.30-0.60	0.020 0.020	0.010 0.010
		WP91							0.400 0.400
									0.010 0.010
A403		WP304	A312 Gr. TP304 A240 Type 304	P PL	0.08 0.15	0.75 1.00	2.00 2.00	0.040 0.045	0.030 0.030
		WP304H	A312 Gr. TP304H A240 Type 304	P PL	0.04-0.10 0.04-0.10	0.75 1.00	2.00 2.00	0.045 0.045	8.00-11.00 8.00-10.05
		WP304L	A312 Gr. TP304L A240 Type 304L	P PL	0.035 0.030	0.75 1.00	2.00 2.00	0.040 0.045	8.00-13.00 8.00-12.00
		WP309	A312 Gr. TP309 A240 Type 3095	P PL	0.15 0.08	0.75 1.00	2.00 2.00	0.040 0.045	12.00-15.00 12.00-15.00
		WP310	A312 Gr. TP310 A240 Type 3105	P PL	0.15 0.08	0.75 1.50	2.00 2.00	0.040 0.045	19.00-22.00 19.00-22.00
		WP316	A312 Gr. TP316 A240 Type 316	P PL	0.08 0.08	0.75 1.00	2.00 2.00	0.040 0.045	11.00-14.00 10.00-14.00
		WP316H	A312 Gr. TP316H A240 Type 316H*	P PL	0.04-0.10 0.04-0.10	0.75 1.00	2.00 2.00	0.040 0.045	11.00-14.00 10.00-14.00
		WP316L	A312 Gr. TP316L A240 Type 316L	P PL	0.035 0.030	0.75 1.00	2.00 2.00	0.040 0.045	10.00-15.00 10.00-14.00
		WP317L	A312 Gr. TP317L A240 Type 317L	P PL	0.035 0.030	0.75 0.75	2.00 2.00	0.040 0.045	11.00-15.00 11.00-15.00
		WP321	A312 Gr. TP321 A240 Type 321	P PL	0.08 0.08	0.75 1.00	2.00 2.00	0.040 0.045	9.00-13.00 9.00-12.00
		WP321H	A312 Gr. TP321H A240 Type 321H*	P PL	0.04-0.10 0.04-0.10	0.75 1.00	2.00 2.00	0.040 0.045	9.00-13.00 9.00-12.00
		WP347	A312 Gr. TP347 A240 Type 347	P PL	0.08 0.08	0.75 1.00	2.00 2.00	0.040 0.045	9.00-13.00 9.00-13.00
		WP347H	A312 Gr. TP347H A240 Type 347H*	P PL	0.04-0.10 0.08	0.75 1.00	2.00 2.00	0.040 0.045	9.00-13.00 9.00-13.00
		WP S31254	A312 S31254 A240 S31254	P PL	0.020 0.020	0.80 1.00	1.00 1.00	0.030 0.030	0.010 17.5 ~18.5
	A420	WPL6	A333 and A334 Gr.6 A516 Gr.60	P PL	0.30 0.21-0.27	0.10 Min. 0.13-0.33	0.29-1.06 0.60-1.25	0.048 0.035	0.058 0.040
		WPL3	A333 and A334 Gr.3 A203 Gr.D	P PL	0.19 0.17-0.20	0.18-0.37 0.13-0.32	0.31-0.64 0.70-0.80	0.050 0.035	3.18- 3.82 3.18- 3.82
		WPL8	A333 and A334 Gr.8 A203 Gr.A	P PL	0.20 0.17	- 0.15-0.40	0.40-1.06 0.70	0.025 0.035	1.60- 2.24 2.10- 2.50
A815		S31803	A790 S31803 A240 S31803	P PL	0.030 0.030	1.0 0.8	2.0 1.2	0.030 0.035	0.020 0.020
		S32750	A790 S32750 A240 S32750	P PL	0.05 0.030	- 1.00	1.2 1.00	0.040 0.030	6.0 ~ 8.0 6.0 ~ 8.0
		S32760	A790 S32760 A240 S32760	P PL	0.030 0.030	- 1.00	1.00 1.00	0.030 0.030	6.00~ 8.00 6.00~ 8.00
A860		WPHY42	API 5L Gr. X42 A572 Gr.42	P PL	- 0.28	- -	1.25 0.40	0.04 0.04	- -
		WPHY60	API 5L Gr. X60 A572 Gr.60	P PL	0.26 0.26	- -	1.35 1.40	0.04 0.04	- -
		WPHY65	API 5L Gr. X65 A572 Gr.65	P PL	0.26 0.26	- -	0.05 0.05	0.05 0.05	- -

• Asterisks(\*) denote that the carbon content shall be 0.04 to 0.10% Daggers(+) denote that the minimum tensile strength shall be 65,000 psi (488 MPa), and that the minimum yield strength shall be 25,000 psi(172MPa)

• The yield strength shall be determined by the offset method at 0.2% limiting permanent set in accordance with ASTM A370 Specification. An alternative method of determining yield strength may be based on a total extension under load of 0.5%

# ASTM MATERIALS

**MSB** [주]엠에스밴드 

Chemical Composition (Percent)			Other Elements	Mechanical			Marking Symbol	
Cr	Mo	Ti		Tensile Strength Min. or Range ksi (Mpa)	Yield Strength Min. ksi(Mpa)	Longitudinal Elongation in 2 in (50mm) Min. %		
-	-	-	-	60 (414)	35(241)	25		
-	-	-	-	65-85 (450-585)	35(240)	23	WPB	
-	-	-	-	70-90 (485-620)	38(260)	21		
-	-	-	-	70 (483)	40(276)	30	WPC	
-	0.44-0.65	-	-	55 (379)	30(207)	30		
-	0.41-0.64	-	-	70-90 (485-620)	40(275)	21	WP1	
0.80-1.25	-	-	-	60 (414)	30(207)	30		
0.74-0.21	0.40-0.65	-	-	56-80 (380-550)	33(230)	22	WP12	
1.00-0.50	0.40-0.65	-	-	60 (414)	30(207)	30		
0.94-1.56	0.40-0.70	-	-	60-85 (415-585)	35(240)	22	WP11	
1.90-2.62	0.87-1.13	-	-	60 (414)	30(207)	30		
1.88-2.62	0.85-1.15	-	-	60-85 (415-585)	30(205)	18	WP22	
4.00-6.00	0.45-0.65	-	-	60 (414)	30(207)	30		
4.00-6.00	0.40-0.70	-	-	60-85 (415-585)	30(205)	18	WP5	
8.00-10.00	0.90-1.10	-	-	60 (414)	30(205)	30		
8.00-10.00	0.90-1.10	-	-	60-85 (415-585)	30(205)	18	WP9	
8.00-9.50	0.85-1.05	-	V:0.18-0.25 Cb:0.06-10	85 (585)	60(415)	-		
8.00-9.50	0.85-1.05	-	N:0.030-0.070 Al:0.04	85-110 (585-760)	60(415)	18	WP91	
18.00-20.00	-	-	-	75 (517)	30(207)	30		
18.00-20.00	-	-	-	75 (515)	30(205)	40	WP304	
18.00-20.00	-	-	-	75 (517)	25(172)	35		
18.00-20.00	-	-	-	75 (515)	25(175)	40	WP304H	
18.00-20.00	-	-	-	65 (448)	30(207)	30		
18.00-20.00	-	-	-	65 (448)	30(205)	40	WP304L	
22.00-24.00	-	-	-	75 (517)	30(207)	30	WP309	
22.00-24.00	-	-	-	75 (515)	30(205)	40		
24.00-26.00	-	-	-	75 (517)	30(207)	30		
24.00-26.00	-	-	-	75 (515)	30(205)	40	WP310	
16.00-18.00	2.00-3.00	-	-	75 (517)	30(207)	35		
16.00-18.00	2.00-3.00	-	-	75 (515)	30(205)	40	WP316	
16.00-18.00	2.00-3.00	-	-	75 (517)	30(207)	35		
16.00-18.00	2.00-3.00	-	-	75 (515)	30(205)	40	WP316H	
16.00-18.00	2.00-3.00	-	-	75 (517)	25(172)	35		
16.00-18.00	2.00-3.00	-	-	75 (515)	25(170)	40	WP316L	
18.00-20.00	3.00-4.00	-	-	75 (515)	30(205)	35		
18.00-20.00	3.00-4.00	-	N=0.10	80 (550)	35(240)	40	WP317L	
17.00-19.00	-	5 × C-0.60	-	70 (483)	30(207)	35		
17.00-19.00	-	5 × C-0.70	-	65 (448)	30(205)	40	WP321	
17.00-20.00	-	4 × C-0.60	-	75 (517)	30(207)	35		
17.00-19.00	-	4 × C-0.70	-	75 (515)	30(205)	40	WP321H	
17.00-20.00	-	-	Ca+Ta10 × C-1.00	75 (517)	30(207)	35		
17.00-19.00	-	-	Ca+Ta10 × C-1.00	75 (515)	30(205)	40	WP347	
17.00-20.00	-	-	Ca+Ta 8 × C-1.00	75 (517)	30(207)	30		
17.00-19.00	-	-	Ca+Ta10 × C-1.00	75 (515)	30(205)	40	WP347H	
19.50-20.50	6.00-6.50	-	N:0.18-0.22 Cu:0.50-1.00	94 (460)	650 (440)	44(300)	35	S31254
-	-	-	-	60 (441)	35(241)	30		
-	-	-	-	60-80 (415-550)	35(220)	25	WPL6	
-	-	-	-	65 (448)	35(241)	30		
-	-	-	-	65-85 (450-585)	37(255)	23	WPL3	
-	-	-	Cu-0.75-1.25	63 (450-585)	46(315)	28		
-	-	-	-	65-85 (450-585)	37(255)	23	WPL8	
21.00-23.00	2.50-3.50	-	N:0.08-0.20	90 (460)	620 (450)	25	S31803	
24.00-26.00	3.00-5.00	-	N:0.24-0.32 Cu:0.5	116 (460)	795 (550)	15	S32750	
24.00-26.00	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 (460)	750 (550)	80(550)	25	S32760	
-	-	0.03Min.	-	60 (414)	42(289)	24	WPHY42	
-	-	-	Cb:0.005min. V:0.02min.	75 (450)	517 (448)	60(413)	18	WPHY60
-	-	-	Cb:0.005min. V:0.02min.	77 (550)	530 (448)	65(448)	17	WPHY65

• The basic minimum elongation for walls 3/16(7.94mm) and over in thickness shall be determined according to strip tests;

all small sizes are tested in their full section.

• P denotes Pipe, PL Plate.

# MATERIALS SPECIFICATIONS FOR JIS MATERIALS

Marking Symbol	JIS Code Number & Materials	Chemical Composition(Percent)					
		C	Si	Mn	P	S	Ni
SGP	G3452, SGP	-	-	-	0.050Max.	0.050Max.	-
PG370	G3454, STPG370	0.25Max.	0.35Max.	0.30-0.90	0.040Max.	0.040Max.	-
PG410	G3454, STPG410	0.30Max.	0.35Max.	0.30-1.00	0.040Max.	0.040Max.	-
PT370	G3456, STPT370	0.25Max.	0.10-0.35	0.30-0.90	0.035Max.	0.035Max.	-
PT410	G3456, STPT410	0.30Max.	0.10-0.35	0.30-1.00	0.035Max.	0.035Max.	-
PT480	G3456, STPT480	0.33Max.	0.10-0.35	0.30-1.00	0.035Max.	0.035Max.	-
STS370	G3455, STS370	0.25Max.	0.10-0.35	0.30-1.10	0.035Max.	0.035Max.	-
STS410	G3455, STS410	0.30Max.	0.10-0.35	0.30-1.40	0.035Max.	0.035Max.	-
STS480	G3455, STS480	0.33Max.	0.10-0.35	0.30-1.50	0.035Max.	0.035Max.	-
PY400	G3457, STPY400	-	-	-	0.050Max.	0.050Max.	-
SUS304	G3459, SUS304TP	0.08Max.	1.00Max.	2.00Max.	0.040Max.	0.030Max.	8.00-11.00
SUS304H	G3459, SUS304HTP	0.04-1.00	0.75Max.	2.00Max.	0.040Max.	0.030Max.	8.00-11.00
SUS304L	G3459, SUS304LTP	0.03Max.	1.00Max.	2.00Max.	0.040Max.	0.030Max.	9.00-13.00
SUS316	G3459, SUS16TP	0.08Max.	1.00Max.	2.00Max.	0.040Max.	0.030Max.	10.00-14.00
SUS316H	G3459, SUS316HTP	0.04-1.00	0.75Max.	2.00Max.	0.030Max.	0.030Max.	11.00-14.00
SUS316L	G3459, SUS316LTP	0.03Max.	1.00Max.	2.00Max.	0.040Max.	0.030Max.	12.00-16.00
PL380	G3460, STPL380	0.25Max.	0.35Max.	1.35Max.	0.035Max.	0.035Max.	-
PL450	G3460, STPL450	0.18Max.	0.10-0.35	0.30-0.60	0.030Max.	0.030Max.	3.00-3.80
SS400	G3101, SS400	-	-	-	0.050Max.	0.050Max.	-
SM400B	G3106, SM400B	0.20Max.	0.35Max.	0.60-1.20	0.040Max.	0.040Max.	-
SM490B	G3106, SM490B	0.18Max.	0.55Max.	1.50Max.	0.040Max.	0.040Max.	-
SB410	G3103, SB410	0.24Max.	0.15-0.30	0.90Max.	0.035Max.	0.040Max.	-
SB450	G3103, SB450	0.28Max.	0.15-0.30	0.90Max.	0.035Max.	0.040Max.	-
S20C	G4051, S20C	0.18-0.23	0.15-0.35	0.30-0.60	0.030Max.	0.035Max.	-
S25C	G4051, S25C	0.22-0.28	0.15-0.35	0.30-0.60	0.030Max.	0.035Max.	-
S45C	G4051, S45C	0.42-0.48	0.15-0.30	0.30-0.90	0.030Max.	0.035Max.	-
SF45	G3201, SF45	0.60Max.	0.15-0.50	0.30-1.20	0.030Max.	0.035Max.	-
SF50	G3201, SF50	0.60Max.	0.15-0.50	0.30-1.20	0.030Max.	0.035Max.	-

Chemical Composition (percent)		Mechanical Requirements			Reduction of Area	Hardness (HB)	Marking Symbol
Cr	Mo	Tensile Strength kgf/mm <sup>2</sup> (N/mm <sup>2</sup> )	Yield Strength kgf/mm <sup>2</sup> (N/mm <sup>2</sup> )	Elongation(%) Test Piece No.			
-	-	30 Min. (294) Min.	-	(11.12) 30 Min. (5) 25 Min.	-	-	SGP
-	-	38 Min. (373) Min.	22 Min. (216) Min.	(11.12) 30 Min. (5) 25 Min.	-	-	PG370
-	-	42 Min. (412) Min.	25 Min. (245) Min.	(11.12) 25 Min. (5) 20 Min.	-	-	PG410
-	-	38 Min. (373) Min.	22 Min. (216) Min.	(11.12) 30 Min. (5) 25 Min.	-	-	PT370
-	-	42 Min. (412) Min.	25 Min. (245) Min.	(11.12) 25 Min. (5) 20 Min.	-	-	PT410
-	-	49 Min. (481) Min.	28 Min. (275) Min.	(11.12) 25 Min. (5) 20 Min.	-	-	PT480
-	-	38 Min. (373) Min.	22 Min. (216) Min.	(11.12) 30 Min. (5) 25 Min.	-	-	STS370
-	-	42 Min. (412) Min.	25 Min. (245) Min.	(11.12) 25 Min. (5) 20 Min.	-	-	STS410
-	-	49 Min. (481) Min.	28 Min. (275) Min.	(11.12) 25 Min. (5) 20 Min.	-	-	STS480
-	-	41 Min. (402) Min.	23 Min. (226) Min.	(5) 18 Min.	-	-	PY400
18.00-20.00	-	53 Min. (520) Min.	21 Min. (206) Min.	(11.12) 35 Min. (5) 25 Min.	-	-	SUS304
18.00-20.00	-	53 Min. (520) Min.	21 Min. (206) Min.	(11.12) 35 Min. (5) 25 Min.	-	-	SUS304H
18.00-20.00	-	49 Min. (481) Min.	18 Min. (177) Min.	(11.12) 35 Min. (5) 25 Min.	-	-	SUS304L
16.00-18.00	2.00-3.00	53 Min. (520) Min.	21 Min. (206) Min.	(11.12) 35 Min. (5) 25 Min.	-	-	SUS316
16.00-18.00	2.00-3.00	53 Min. (520) Min.	21 Min. (206) Min.	(11.12) 35 Min. (5) 25 Min.	-	-	SUS316H
16.00-18.00	2.00-3.00	49 Min. (481) Min.	18 Min. (177) Min.	(11.12) 35 Min. (5) 25 Min.	-	-	SUS316L
-	-	39 Min. (382) Min.	21 Min. (206) Min.	(11.12) 35 Min. (5) 25 Min.	-	-	PL380
-	-	46 Min. (451) Min.	25 Min. (245) Min.	(11.12) 30 Min. (5) 20 Min.	-	-	PL450
-	-	41-52 (402-510)	16tMAX. 25 Min. (245)	(5) 21 Min. (14) 17 Min.	-	-	SS400
-	-	41-52 (402-510)	16tMAX. 25 Min. (245)	(5) 23 Min. (1A) 18 Min.	-	-	SM400B
-	-	50-62 (490-608)	16tMAX. 33 Min. (324)	(5) 22 Min. (1A) 17 Min.	-	-	SM490B
-	-	42-56 (412-549)	23 Min. (226) Min.	(1A) 21 Min. (10) 25 Min.	-	-	SB410
-	-	46-60 Min. (451-588)	25 Min. (245) Min.	(1A) 19 Min. (10) 23 Min.	-	-	SB450
-	-	41 Min. (402) Min.	(N)25 Min. (245) Min.	28 Min.	-	116-174	S20C
-	-	45 Min. (441) Min.	(N)27 Min. (265) Min.	27 Min.	-	123-183	S25C
-	-	58 Min. (569) Min.	(N)35 Min. (343) Min.	20 Min.	-	167-227	S45C
-	-	45-55 (444-539)	(N)23 Min. (226) Min.	(14A)(A)24 Min. (T)19 Min.	(A)45 (T)35	121Min.	SF45
-	-	50-60 (490-588)	(N)25 Min. (245) Min.	(14A)(A)22 Min. (T)17 Min.	(A)40 (T)30	134Min.	SF50

# WALL THICKNESS OF WELDED AND SEAMLESS PIPE

Nominal Pipe Size		Outside Diameter		Nominal Wall Thickness								
A	B	KS/JIS	ANSI	SPP	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	2.77	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	323.80	6.9	3.96	4.57	-	6.5	6.35	8.38	9.52	
350	14	355.60	355.60	7.9	3.96	4.78	6.35	8.0	7.92	9.52	9.52	
400	16	406.40	406.40	7.9	4.19	4.78	6.35	8.0	7.92	9.52	9.52	
450	18	457.20	457.20	7.9	4.19	4.78	6.35	8.0	7.92	11.12	9.52	
500	20	508.00	508.00	7.9	4.78	5.54	6.35	9.5	9.52	12.70	9.52	
550	22	558.80	558.80	-	4.78	5.54	6.35	-	9.52	12.70	9.52	
600	24	609.60	609.60	-	5.54	6.35	6.35	-	9.52	14.27	9.52	
650	26	660.40	660.40	-	-	7.92	7.92	-	12.70	-	-	9.52
700	28	711.20	711.20	-	-	7.92	7.92	-	12.70	15.88	9.52	
750	30	762.00	762.00	-	6.35	7.92	7.92	-	12.70	15.88	9.52	
800	32	812.80	812.80	-	-	7.92	7.92	-	12.70	15.88	9.52	
850	34	863.60	863.60	-	-	7.92	7.92	-	12.70	15.88	9.52	
900	36	914.40	914.40	-	-	7.92	7.92	-	12.70	15.88	9.52	
950	38	965.20	965.20	-	-	7.92	-	-	-	-	-	9.52
1000	40	1016.00	1016.00	-	-	7.92	-	-	-	-	-	9.52
1050	42	1066.80	1066.80	-	-	7.92	-	-	-	-	-	9.52
1100	44	1117.60	1117.60	-	-	7.92	-	-	-	-	-	9.52
1150	46	1168.40	1168.40	-	-	7.92	-	-	-	-	-	9.52
1200	48	1219.20	1219.20	-	-	7.92	-	-	-	-	-	9.52

Unit : mm

STD	Nominal Wall Thickness										Nominal pipe Size Inch
	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
9.52	10.31	14.27	12.70	12.70	17.48	21.44	25.40	28.58	33.32	25.40	12
9.52	11.13	15.09	12.70	12.70	19.05	23.83	27.79	31.75	35.71	-	14
9.52	12.70	16.66	12.70	12.70	21.44	26.19	30.96	36.52	40.49	-	16
9.52	14.27	19.05	12.70	12.70	23.82	29.36	34.92	39.67	45.24	-	18
9.52	15.09	20.62	12.70	12.70	26.19	32.54	38.10	44.45	50.01	-	20
9.52	-	22.22	12.70	12.70	28.58	34.92	41.28	47.62	53.98	-	22
9.52	17.48	24.61	12.70	12.70	30.96	38.89	46.02	52.37	59.54	-	24
9.52	-	-	12.70	12.70	-	-	-	-	-	-	26
9.52	-	-	12.70	12.70	-	-	-	-	-	-	28
9.52	-	-	12.70	12.70	-	-	-	-	-	-	30
9.52	17.48	-	12.70	12.70	-	-	-	-	-	-	32
9.52	17.48	-	12.70	12.70	-	-	-	-	-	-	34
9.52	19.05	-	12.70	12.70	-	-	-	-	-	-	36
9.52	-	-	12.70	12.70	-	-	-	-	-	-	38
9.52	-	-	12.70	12.70	-	-	-	-	-	-	40
9.52	-	-	12.70	12.70	-	-	-	-	-	-	42
9.52	-	-	12.70	12.70	-	-	-	-	-	-	44
9.52	-	-	12.70	12.70	-	-	-	-	-	-	46
9.52	-	-	12.70	12.70	-	-	-	-	-	-	48



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