

STEEL BUTT-WELDING PIPE FITTINGS



Manufacturing | Import | Export



REGISTRATION NO. Q1-1849

Certificate of Registration

The American Petroleum Institute certifies that the quality management system of

APCO PIPE FITTING CO., LTD
No. 50, Shiji Road South, Gao Xin Area
Yingkou, Liaoning
People's Republic of China

has been assessed by the American Petroleum Institute and found to be in conformance with the following:

API Specification Q1

The scope of this registration and the approved quality management system applies to the:

Manufacture and Service of Seamless Steel Pipe Fittings and Connectors

API approves the organization's justification for excluding:

Design and Development; Servicing



Effective Date: FEBRUARY 17, 2017
Expiration Date: AUGUST 19, 2019
Registered Since: DECEMBER 31, 2012

Vice President, API Global Industry Services

This certificate is valid for the period specified herein. The registered organization must continually meet all requirements of API Spec Q1, *Specification for Quality Programs for the Petroleum, Petrochemical and Natural Gas Industry*, and the requirements of the Registration Agreement. Registration is maintained and regularly monitored through annual full system audits. This certificate has been issued from API offices located at 1220 L Street, N.W., Washington, D.C. 20005-4070, U.S.A. It is the property of API, and must be returned upon request. **To verify the authenticity of this certificate, go to www.api.org/compositelist.**

Certificate of Approval

This is to certify that the Management System of:

APCO PIPE FITTINGS CO., LTD.

No.50, Shiji Road South, Xishi District, Yingkou City, China (Liaoning) Polit Free Trade Zone 115004, China

Unified Social Credit Code: 912108007018342788

has been approved by LRQA to the following standards:

ISO 9001:2015

GB/T 19001-2016



Rhett Wang - Area Operations Manager, Greater China

Issued by: Lloyd's Register Quality Assurance (Shanghai) Co., Ltd.

for and on behalf of: Lloyd's Register Quality Assurance Limited

Current issue date: 20 August 2018

Expiry date: 19 August 2021

Certificate identity number: 10114884

Original approval(s):

ISO 9001 – 20 August 2012

Approval number(s): ISO 9001 – 00015412

The scope of this approval is applicable to:

Manufacture of steel pipe fittings and flanges for export purpose.



001

EC Certificate of Quality System Approval

**In accordance with the requirements of the Pressure Equipment
Directive 2014/68/EU and the Pressure Equipment (Safety)
Regulations 2016,
UK Statutory Instrument 2016 No. 1105**

This is to certify that the Quality Management System of:

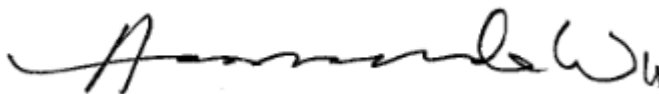
APCO Pipe Fittings Co., Ltd.
No. 50, Shiji Road South, Xishi District, Yingkou City,
China (Liaoning) Polit Free Trade Zone, 115004,
People's Republic of China
Unified Social Credit Code: 912108007018342788

Has been assessed against the requirements of Annex I, paragraph 4.3 of the Pressure Equipment Directive 2014/68/EU, and Schedule 1, paragraph 4.3 of the Pressure Equipment (Safety) Regulations 2016, UK Statutory Instrument 2016 No. 1105 and conforms to the requirements for the products shown below:

**Manufacture of steel pipe fittings and flanges in accordance with Annex I
paragraph 4.3 of the Pressure Equipment Directive.**

Approval is subject to the continued maintenance of the quality system in accordance with the requirements of the above Directive and Regulations, and continuing to comply with the QMS Certificate Number 00015412. Products are as listed on the attached schedule.

Certificate Number:	BJG6015383/A
Original Approval Date:	20 August 2012
Current Issue Date:	20 August 2018
Expiry Date:	19 August 2021
LRV Notified Body Number:	0038



Amanda Wu on behalf of Lloyd's Register Verification

EC Certificate of Quality System Approval

CERTIFICATE BJG6015383/A SCHEDULE

APCO Pipe Fittings Co., Ltd.
No. 50, Shiji Road South, Xishi District, Yingkou City,
China (Liaoning) Polit Free Trade Zone, 115004,
People's Republic of China

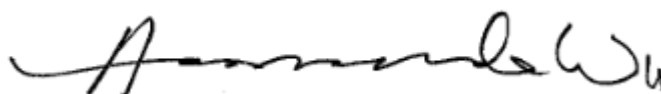
Products:

- 1, Butt-welding Pipe Fittings as per ASME B16.9, NPS ½"-48"
- 2, Butt-welding Pipe Fittings as per MSS SP-75, NPS 16"-60"
- 3, Butt-welding Pipe Fittings as per CSA Z245.11, NPS ½"-48"

Material Grades and Standards:

Product description	Standard, Grade, Size
ASTM A234	WPB, WPC, WP5, WP9, WP11, WP22
ASTM A420	WPL6
ASTM A403	WP304/304L/304H, WP316/316L/316H, WP321/321H
ASTM A860	WPHY52, WPHY60, WPHY65, WPHY70
ASTM A106	Gr. A, Gr. B, Gr. C
API SPECIFICATION 5L	X42, X46, X52, X60, X65, X70
ASTM A515	60, 65, 70
ASTM A516	55, 60, 65, 70
CSA Z245.11	241, 290, 317, 359, 386, 414, 448, 483 Note: All grades cover category I and category II (clause 1.2.3)

Schedule Issue: 05
Date of Schedule Issue: 20 August 2018
Date of Expiry: 19 August 2021
LRV Notified Body Number: 0038



Amanda Wu on behalf of Lloyd's Register Verification

EC Certificate of Quality System Approval

CERTIFICATE BJG6015383/A SCHEDULE

APCO Pipe Fittings Co., Ltd.
No. 50, Shiji Road South, Xishi District, Yingkou City,
China (Liaoning) Polit Free Trade Zone, 115004,
People's Republic of China

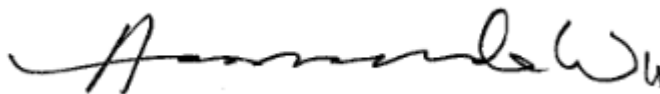
Products:

- 4, Forged Pipe Fittings as per ASME B16.11, NPS 1/8"-4"
 - 5, Pipe Flanges as per ASME B16.5, NPS 1/2"-24"
 - 6, Pipe Flanges as per ASME B16.47, NPS 26"-60"
- (Machinery processing of forged pipe fittings and flanges)

Material Grades and Standards:

Product description	Standard, Grade, Size
ASTM A182	F304, F304L, F304H, F316, F316L, F316H, F317, F317L, F321, F321H, F11
ASTM A350	LF2, LF3
ASTM A694	F42, F46, F48, F50, F52, F56, F60, F65, F70
ASTM A105	A105

Schedule Issue: 05
Date of Schedule Issue: 20 August 2018
Date of Expiry: 19 August 2021
LRV Notified Body Number: 0038



Amanda Wu on behalf of Lloyd's Register Verification

FEATURES, STANDARDS AND PRODUCTS OF OUR BUTT WELDING FITTINGS: 产品的特点和品种

FEATURES: 特点

1. High Class Materials 高质量的原材料

APCO uses only high class raw materials of carbon/alloy steel pipes made from NKK or MANNESSMANN equipment for ordinary, high pressure, low/high temperature, boiler and other purposes.

2. Uniform Wall Thickness and Perfectly Round 均匀的壁厚和完善的圆周

This can be achieved by our particular technical knowhow and our quality control program.

3. Accurate Dimension 精确的尺寸使安装准确, 方便

Efficient piping work can be made only with fittings of correct dimensions and shapes. APCO's fittings are finished to have accurate straight/plane ends, beveled angle...etc. to applicable standards by means of two or three spindle beveling machines.

STANDARDS 可按下列标准生产

APCO's Welding Fittings are manufactured in compliance with the following applicable standards:

ASME B16.9	ASTM A234	MSS-SP43	WPHY60	JIS B2311	DIN2605
	ASTM A403	MSS-SP75	WPHY65	JIS B2312	DIN2606
	ASTM A420	WPHY42	WPHY70	JISB2313	DIN2616
	ASTM A860	WPHY52			DIN2615

PRODUCTS: 产品品种



(180° Elbows) 弯头



(90° Elbows) 弯头



(45° Elbows) 弯头



(Caps) 管帽



(Straight Tees)
同径三通



(Reducing Tees)
异径三通



(Concentric Reducers)
同心异径管



(Eccentric Reducers)
偏心异径管

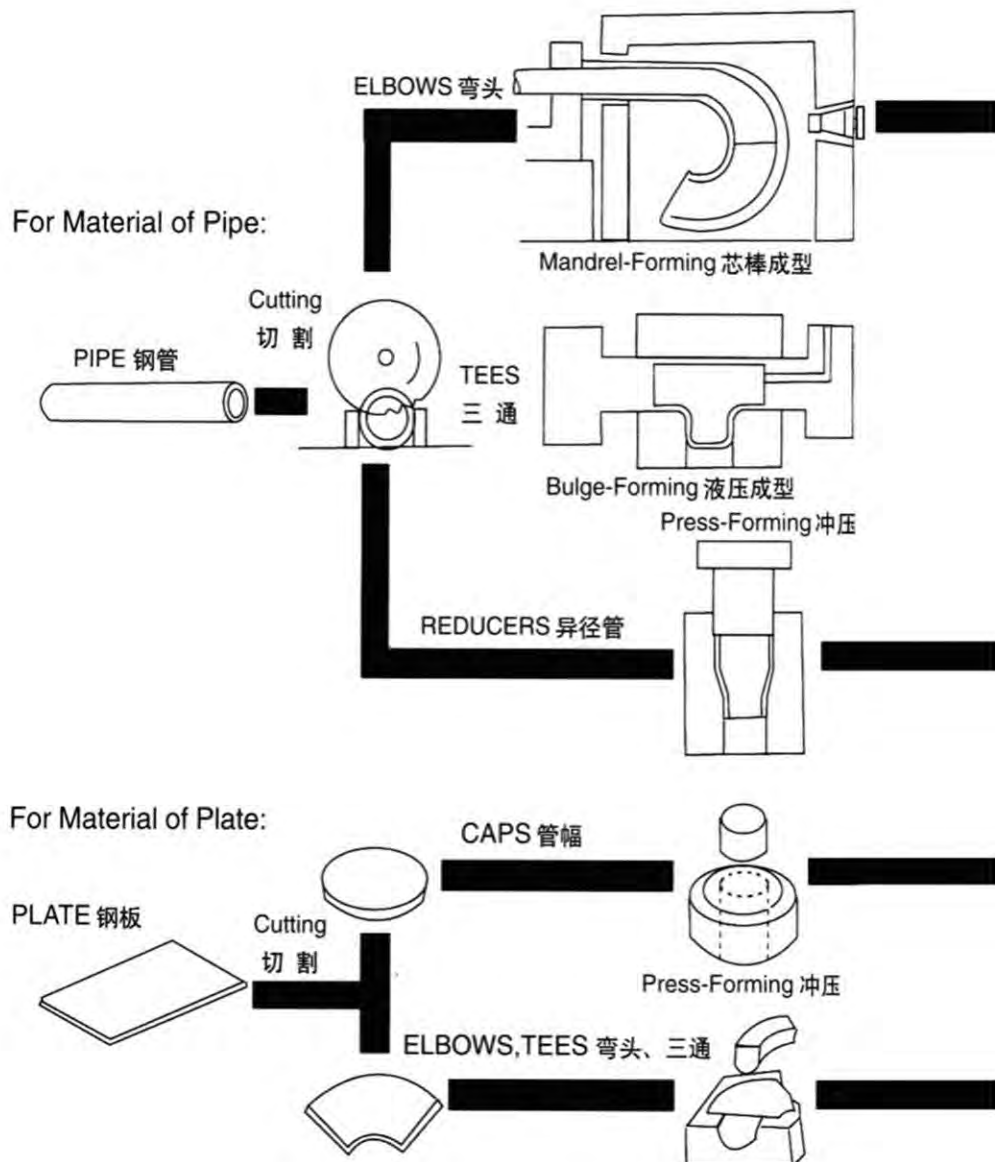


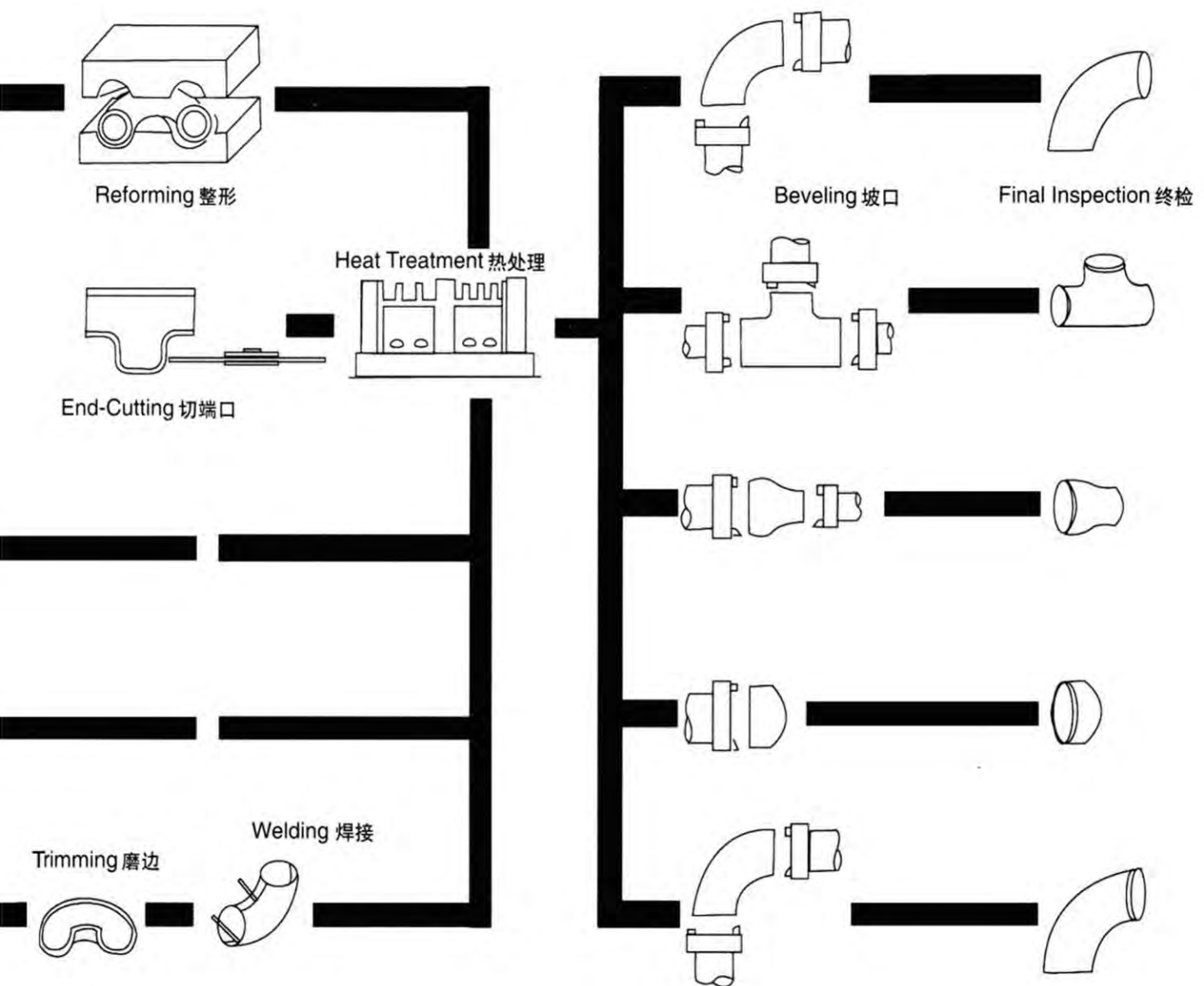
(Crosses) 四通



(Reducing Elbows) 异径弯头

MANUFACTURING METHOD AND PROCESS: 生产工艺流程图



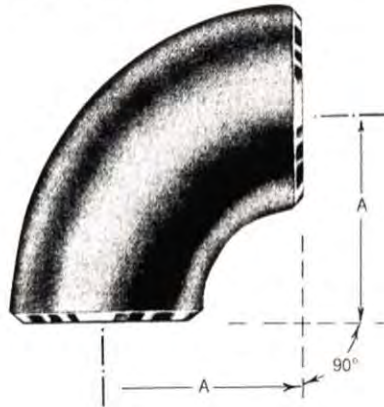


BUTT-WELD FITTINGS

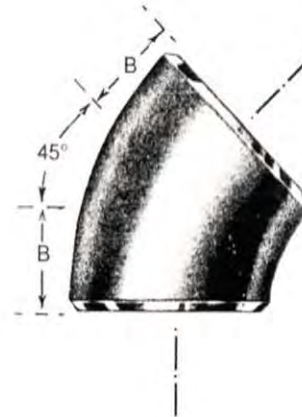
Long radius elbows
长半径弯头

ASME B16.9/ MSS SP-75

90° long radius elbow

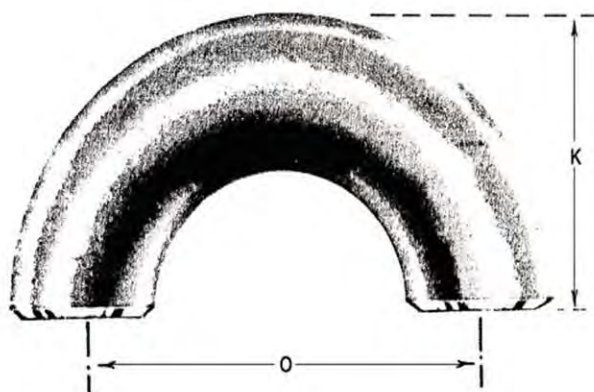


45° long radius elbow



ASME B16.9				MSS SP-75			
NPS	O.D. at Bevel	A (mm)	B (mm)	NPS	O.D. at Bevel	A (mm)	B (mm)
1/2	21,3	38,1	15,9	16	406,4	609,6	254,0
3/4	26,7	38,1	19,1	18	457,2	685,8	285,8
1	33,4	38,1	22,2	20	508,0	762,0	317,5
1 1/4	42,2	47,6	25,4	22	558,8	838,2	342,9
1 1/2	48,3	57,2	28,6	24	609,6	914,4	381,0
2	60,3	76,2	34,9	26	660,4	990,6	406,4
2 1/2	73,0	95,3	44,5	28	711,2	1066,8	438,2
3	88,9	114,3	50,8	30	762,0	1143,0	469,9
3 1/2	101,6	133,4	57,2	32	812,8	1219,2	501,7
4	114,3	152,4	63,5	34	863,6	1295,4	533,4
5	141,3	190,5	79,4	36	914,4	1371,6	565,2
6	168,3	228,6	95,3	38	965,2	1447,8	600,1
8	219,1	304,8	127,0	40	1016,0	1524,0	631,8
10	273,1	381,0	158,7	42	1066,8	1600,2	660,4
12	323,9	457,2	190,5	44	1117,6	1676,4	695,3
14	355,6	533,4	222,3	46	1168,4	1752,6	727,1
16	406,4	609,6	254,0	48	1219,2	1828,8	758,8
18	457,2	685,8	285,8	50	1270	1905	787,4
20	508,0	762,0	317,5	52	1320	1981,2	819,2
22	558,8	838,2	342,9	54	1371,6	2057,4	850,9
24	609,6	914,4	381,0	56	1422,4	2133,6	882,7
26	660,4	990,6	406,4	58	1473,2	2209,8	914,4
28	711,2	1066,8	438,2	60	1524	2286	946,2
30	762,0	1143,0	469,9				
32	812,8	1219,2	501,7				
34	863,6	1295,4	533,4				
36	914,4	1371,6	565,2				
38	965,2	1447,8	600,1				
40	1016,0	1524,0	631,8				
42	1066,8	1600,2	660,4				
44	1117,6	1676,4	695,3				
46	1168,4	1752,6	727,1				
48	1219,2	1828,8	758,8				

ASME B16.9/ MSS SP-75

BUTT-WELD FITTINGS
Long Radius BendsLong Radius Return Bends
长半径180°弯头

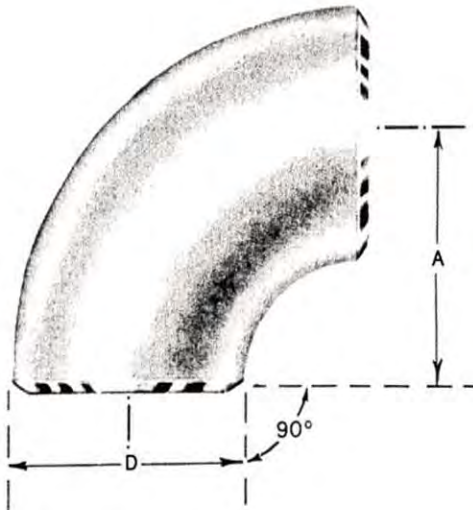
LONG RADIUS RETURN BENDS (dimensions in mm)

ASME B16.9			
NPS	O.D. AT BEVEL	O	K
1/2	21,3	76,2	47,6
3/4	26,7	57,2 OR 76,2	42,9 OR 50,8
1	33,4	76,2	55,6
1¼	42,2	95,3	69,9
1½	48,3	114,3	82,6
2	60,3	152,4	106,4
2½	73,0	190,5	131,8
3	88,9	228,6	158,8
3½	101,6	266,7	184,2
4	114,3	304,8	209,6
5	141,3	381,0	261,9
6	168,3	457,2	312,7
8	219,1	609,6	414,3
10	273,1	762,0	514,5
12	323,9	914,4	619,1
14	355,6	1066,8	711,2
16	406,4	1219,2	812,8
18	457,2	1371,6	914,4
20	508,0	1524,0	1016,0
22	558,8	1676,4	1117,6
24	609,6	1828,8	1219,2

BUTT-WELD FITTINGS

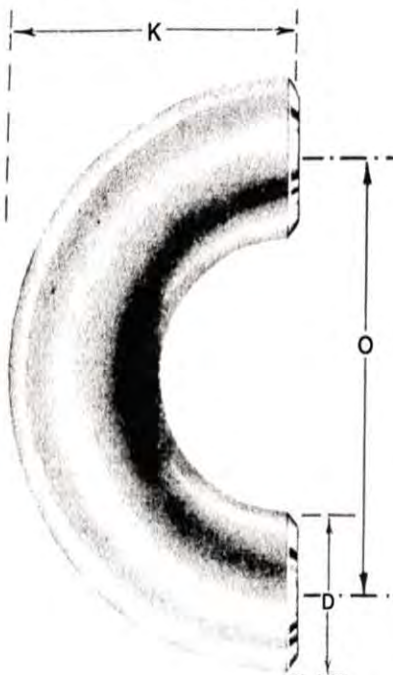
ASME B 16.9

Short radius 90° elbows
90°短半径弯头



ASME B16.9					
NPS	O.D. AT BEVEL D	CENTRE TO END A	NPS	O.D. AT BEVEL D	CENTRE TO END A
1	33,40	25,40	20	508,00	508,00
1¼	42,16	31,75	22	558,80	558,80
1½	48,26	38,10	24	609,60	609,60
2	60,33	50,80	26	660,40	660,40
2½	73,03	63,50	28	711,20	711,20
3	88,90	76,20	30	762,00	762,00
3½	101,60	88,90	32	813,00	813,00
4	114,30	101,60	34	863,60	863,60
5	141,30	127,00	36	914,40	914,40
6	168,28	152,40	38	965,20	965,20
8	219,08	203,20	40	1016,00	1016,00
10	273,05	254,00	42	1066,80	1066,80
12	323,85	304,80	44	1117,60	1117,60
14	355,60	355,60	46	1168,40	1168,40
16	406,40	406,40	48	1219,20	1219,20
18	457,20	457,20			

Short radius 180° returns
180°短半径弯头

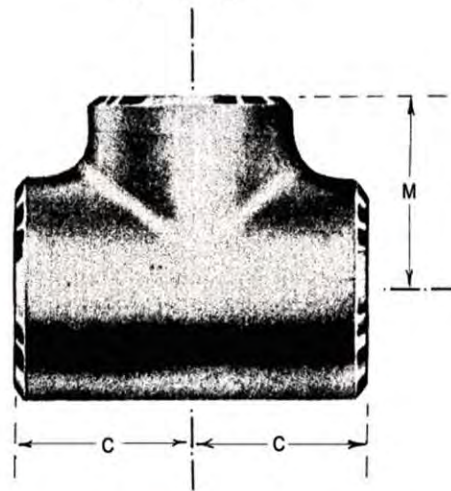


ASME B16.9			
NPS	O.D. AT BEVEL D	CENTRE TO END O	BACK TO FACE K
1	33,40	50,80	41,28
1¼	42,16	63,50	52,39
1½	48,26	76,20	61,91
2	60,33	101,60	80,96
2½	73,03	127,00	100,01
3	88,90	152,40	120,65
3½	101,60	177,80	139,70
4	114,30	203,20	158,75
5	141,30	254,00	196,85
6	168,28	304,80	236,54
8	219,08	406,40	312,74
10	273,05	508,00	390,53
12	323,85	609,60	466,73
14	355,60	711,20	533,40
16	406,40	812,80	609,60
18	457,20	914,40	685,80
20	508,00	1016,00	762,00
22	558,80	1117,60	838,20
24	609,60	1219,20	914,40

ASME B16.9/ MSS SP-75

BUTT-WELD FITTINGS

Tee

Equal Tees
等径三通

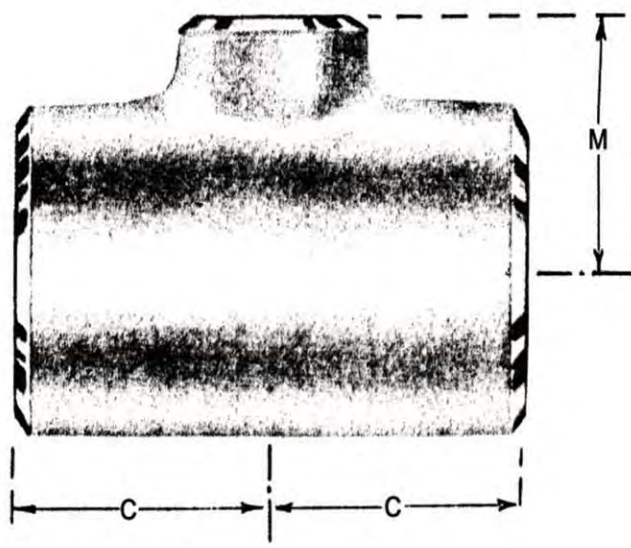
ASME B16.9				MSS SP-75			
NPS	O.D. AT Bevel	C (mm)	M (mm)	NPS	O.D. AT Bevel	C (mm)	M (mm)
1/2	21,3	25,4	25,4	16	406,4	304,8	304,8
3/4	26,7	28,6	28,6	18	457,2	342,9	342,9
1	33,4	38,1	38,1	20	508,0	381,0	381,0
1 1/4	42,2	47,6	47,6	22	558,8	419,1	419,1
1 1/2	48,3	57,2	57,2	24	609,6	431,8	431,8
2	60,3	63,5	63,5	26	660,4	495,3	495,3
2 1/2	73,0	76,2	76,2	28	711,2	520,7	520,7
3	88,9	85,7	85,7	30	762,0	558,8	558,8
3 1/2	101,6	95,3	95,3	32	812,8	596,9	596,9
4	114,3	104,8	104,8	34	863,6	635,0	635,0
5	141,3	123,8	123,8	36	914,4	673,1	673,1
6	168,3	142,9	142,9	38	965,2	711,2	711,2
8	219,1	177,8	177,8	40	1016,0	749,3	749,3
10	273,1	215,9	215,9	42	1066,8	762,0	711,2
12	323,9	254,0	254,0	44	1117,6	812,8	762,0
14	355,6	279,4	279,4	46	1168,4	850,9	800,1
16	406,4	304,8	304,8	48	1219,2	889,0	838,2
18	457,2	342,9	342,9	50	1270	933,5	876,3
20	508,0	381,0	381,0	52	1320	977,9	908,1
22	558,8	419,1	419,1	54	1371,6	1016	946,2
24	609,6	431,8	431,8	56	1422,4	1054,1	977,9
26	660,4	495,3	495,3	58	1473,2	1092,2	1016
28	711,2	520,7	520,7	60	1524	1117,6	1054,1
30	762,0	558,8	558,8				
32	812,8	596,9	596,9				
34	863,6	635,0	635,0				
36	914,4	673,1	673,1				
38	965,2	711,2	711,2				
40	1016,0	749,3	749,3				
42	1066,8	762,0	711,2				
44	1117,6	812,8	762,0				
46	1168,4	850,9	800,1				
48	1219,2	889,0	838,2				

BUTT-WELD FITTINGS

Tees

ASME B16.9/ MSS SP-75

Reducing Outlet Tees
变径三通



REDUCING OUTLET TEES (dimensions in mm)

ASME B16.9						MSS SP-75					
NPS		O.D. AT BEVEL		RUN	OUTLET	NPS		O.D. AT BEVEL		RUN	OUTLET
RUN	OUTLET	RUN	OUTLET	C	M	RUN	OUTLET	RUN	OUTLET	C	M
1/2	3/8	21,3	17,2	25,4	25,4	16	14	406,4	355,6	304,8	304,8
1/2	1/4	21,3	13,7	25,4	25,4	16	12	406,4	323,9	304,8	295,3
3/4	1/2	26,7	21,3	28,6	28,6	16	10	406,4	273,1	304,8	282,6
3/4	3/8	26,7	17,2	28,6	28,6	16	8	406,4	219,1	304,8	273,1
1	3/4	33,4	26,7	38,1	38,1	16	6	406,4	168,3	304,8	263,5
1	1/2	33,4	21,3	38,1	38,1	18	16	457,2	406,4	342,9	330,2
1 1/4	1	42,2	33,4	47,6	47,6	18	14	457,2	355,6	342,9	330,2
1 1/4	3/4	42,2	26,7	47,6	47,6	18	12	457,2	323,9	342,9	320,7
1 1/4	1/2	42,2	21,3	47,6	47,6	18	10	457,2	273,1	342,9	308,0
1 1/2	1 1/4	48,3	42,2	57,2	57,2	18	8	457,2	219,1	342,9	298,5
1 1/2	1	48,3	33,4	57,2	57,2	20	18	508,0	457,2	381,0	368,3
1 1/2	3/4	48,3	26,7	57,2	57,2	20	16	508,0	406,4	381,0	355,6
1 1/2	1/2	48,3	21,3	57,2	57,2	20	14	508,0	355,6	381,0	355,6
2	1 1/2	60,3	48,3	63,5	60,3	20	12	508,0	323,9	381,0	346,1
2	1 1/4	60,3	42,2	63,5	57,2	20	10	508,0	273,1	381,0	333,4
2	1	60,3	33,4	63,5	50,8	20	8	508,0	219,1	381,0	323,9
2	3/4	60,3	26,7	63,5	44,5	22	20	558,8	508,0	419,1	406,4
2 1/2	2	73,0	60,3	76,2	69,9	22	18	558,8	457,2	419,1	393,7
2 1/2	1 1/2	73,0	48,3	76,2	66,7	22	16	558,8	406,4	419,1	381,0
2 1/2	1 1/4	73,0	42,2	76,2	63,5	22	14	558,8	355,6	419,1	381,0
2 1/2	1	73,0	33,4	76,2	57,2	22	12	558,8	323,9	419,1	371,5
3	2 1/2	88,9	73,0	85,7	82,6	22	10	558,8	273,1	419,1	358,8
3	2	88,9	60,3	85,7	76,2	24	22	609,6	558,8	431,8	431,8
3	1 1/2	88,9	48,3	85,7	73,0	24	20	609,6	508,0	431,8	431,8
3	1 1/4	88,9	42,2	85,7	69,9	24	18	609,6	457,2	431,8	419,1
3 1/2	3	101,6	88,9	95,3	92,1	24	16	609,6	406,4	431,8	406,4
3 1/2	2 1/2	101,6	73,0	95,3	88,9	24	14	609,6	355,6	431,8	406,4
3 1/2	2	101,6	60,3	95,3	82,6	24	12	609,6	323,9	431,8	396,9
3 1/2	1 1/2	101,6	48,3	95,3	79,4	24	10	609,6	273,1	431,8	384,2

ASME B16.9/ MSS SP-75

BUTT-WELD FITTINGS

ASME B16.9						MSS SP-75					
NPS		O.D. AT BEVEL		RUN	OUTLET	NPS		O.D. AT BEVEL		RUN	OUTLET
RUN	OUTLET	RUN	OUTLET	C	M	RUN	OUTLET	RUN	OUTLET	C	M
4	3½	114,3	101,6	104,8	101,6	26	24	660,4	609,6	495,3	482,6
4	3	114,3	88,9	104,8	98,4	26	22	660,4	558,8	495,3	469,9
4	2½	114,3	73,0	104,8	95,3	26	20	660,4	508,0	495,3	457,2
4	2	114,3	60,3	104,8	88,9	26	18	660,4	457,2	495,3	444,5
4	1½	114,3	48,3	104,8	85,7	26	16	660,4	406,4	495,3	431,8
5	4	141,3	114,3	123,8	117,5	26	14	660,4	355,6	495,3	431,8
5	3½	141,3	101,6	123,8	114,3	26	12	660,4	323,9	495,3	422,3
5	3	141,3	88,9	123,8	111,1	28	26	711,2	660,4	520,7	520,7
5	2½	141,3	73,0	123,8	108,0	28	24	711,2	609,6	520,7	508
5	2	141,3	60,3	123,8	104,8	28	22	711,2	558,8	520,7	495,3
6	5	168,3	141,3	142,9	136,5	28	20	711,2	508	520,7	482,6
6	4	168,3	114,3	142,9	130,2	28	18	711,2	457,2	520,7	469,9
6	3½	168,3	101,6	142,9	127,0	28	16	711,2	406,4	520,7	457,2
6	3	168,3	88,9	142,9	123,8	28	14	711,2	355,6	520,7	457,2
6	2½	168,3	73,0	142,9	120,7	28	12	711,2	323,9	520,7	447,5
8	6	219,1	168,3	177,8	168,3	30	26	762,0	660,4	558,8	546,1
8	5	219,1	141,3	177,8	161,9	30	24	762,0	609,6	558,8	533,4
8	4	219,1	114,3	177,8	155,6	30	22	762,0	558,8	558,8	520,7
8	3½	219,1	101,6	177,8	152,4	30	20	762,0	508,0	558,8	508,0
10	8	273,1	219,1	215,9	203,2	30	18	762,0	457,2	558,8	495,3
10	6	273,1	168,3	215,9	193,7	30	16	762,0	406,4	558,8	482,6
10	5	273,1	141,3	215,9	190,5	30	14	762,0	355,6	558,8	482,6
10	4	273,1	114,3	215,9	184,2	30	12	762,0	323,9	558,8	473,1
12	10	323,9	273,1	254,0	241,3	30	10	762,0	273,1	558,8	460,4
12	8	323,9	219,1	254,0	228,6	32	30	812,8	762	596,9	584,2
12	6	323,9	168,3	254,0	219,1	32	28	812,8	711,2	596,9	571,5
12	5	323,9	141,3	254,0	215,9	32	26	812,8	660,4	596,9	571,5
14	12	355,6	323,9	279,4	269,9	32	24	812,8	609,6	596,9	558,8
14	10	355,6	273,1	279,4	257,2	32	22	812,8	558,8	596,9	546,1
14	8	355,6	219,1	279,4	247,7	32	20	812,8	508	596,9	533,4
14	6	355,6	168,3	279,4	238,1	32	18	812,8	457,2	596,9	520,7
16	14	406,4	355,6	304,8	304,8	32	16	812,8	406,4	596,9	508
16	12	406,4	323,9	304,8	295,3	32	14	812,8	355,6	596,9	508
16	10	406,4	273,1	304,8	282,6	34	30	863,6	762,0	635,0	609,6
16	8	406,4	219,1	304,8	273,1	34	26	863,6	660,4	635,0	596,9
16	6	406,4	168,3	304,8	263,5	34	24	863,6	609,6	635,0	584,2
18	16	457,2	406,4	342,9	330,2	34	22	863,6	558,8	635,0	571,5
18	14	457,2	355,6	342,9	330,2	34	20	863,6	508,0	635,0	558,8
18	12	457,2	323,9	342,9	320,7	34	18	863,6	457,2	635,0	546,1
18	10	457,2	273,1	342,9	308,0	34	16	863,6	406,4	635,0	533,4
18	8	457,2	219,1	342,9	298,5	36	34	914,4	863,6	673,1	660,4
20	18	508,0	457,2	381,0	368,3	36	30	914,4	762,0	673,1	635,0
20	16	508,0	406,4	381,0	355,6	36	26	914,4	660,4	673,1	622,3
20	14	508,0	355,6	381,0	355,6	36	24	914,4	609,6	673,1	609,6
20	12	508,0	323,9	381,0	346,1	36	22	914,4	558,8	673,1	596,9
20	10	508,0	273,1	381,0	333,4	36	20	914,4	508,0	673,1	584,2
20	8	508,0	219,1	381,0	323,9	36	18	914,4	457,2	673,1	571,5
22	20	558,8	508,0	419,1	406,4	36	16	914,4	406,4	673,1	558,8
22	18	558,8	457,2	419,1	393,7	38	36	965,2	914,4	711,2	711,2
22	16	558,8	406,4	419,1	381,0	38	34	965,2	863,6	711,2	698,5
22	14	558,8	355,6	419,1	381,0	38	32	965,2	812,8	711,2	685,8
22	12	558,8	323,9	419,1	371,5	38	30	965,2	762,0	711,2	673,1
22	10	558,8	273,1	419,1	358,8	38	26	965,2	660,4	711,2	647,7
24	22	609,6	558,8	431,8	431,8	38	24	965,2	609,6	711,2	635,0
24	20	609,6	508,0	431,8	431,8	38	22	965,2	558,8	711,2	622,3
24	18	609,6	457,2	431,8	419,1	38	20	965,2	508,0	711,2	609,6
24	16	609,6	406,4	431,8	406,4	38	18	965,2	457,2	711,2	596,9
24	14	609,6	355,6	431,8	406,4	40	38	1016,0	965,2	749,3	749,3
24	12	609,6	323,9	431,8	396,9	40	36	1016,0	914,4	749,3	736,6
24	10	609,6	273,1	431,8	384,2	40	34	1016,0	863,6	749,3	723,9

BUTT-WELD FITTINGS

ASME B16.9/ MSS SP-75

REDUCING OUTLET TEES (dimensions in mm) - continued

ASME B16.9						MSS SP-75					
NPS		O.D. AT BEVEL		RUN	OUTLET	NPS		O.D. AT BEVEL		RUN	OUTLET
RUN	OUTLET	RUN	OUTLET	C	M	RUN	OUTLET	RUN	OUTLET	C	M
26	24	660,4	609,6	495,3	482,6	40	32	1016,0	812,8	749,3	711,2
26	22	660,4	558,8	495,3	469,9	40	30	1016,0	762,0	749,3	698,5
26	20	660,4	508,0	495,3	457,2	40	26	1016,0	660,4	749,3	673,1
26	18	660,4	457,2	495,3	444,5	40	24	1016,0	609,6	749,3	660,4
26	16	660,4	406,4	495,3	431,8	40	22	1016,0	558,8	749,3	647,7
26	14	660,4	355,6	495,3	431,8	40	20	1016,0	508,0	749,3	635,0
26	12	660,4	323,9	495,3	422,3	40	18	1016,0	457,2	749,3	622,3
28	26	711,2	660,4	520,7	520,7	42	36	1066,8	914,4	762,0	711,2
28	24	711,2	609,6	520,7	508,0	42	34	1066,8	863,6	762,0	711,2
28	22	711,2	558,8	520,7	495,3	42	32	1066,8	812,8	762,0	711,2
28	20	711,2	508,0	520,7	482,6	42	30	1066,8	762,0	762,0	711,2
28	18	711,2	457,2	520,7	469,9	42	28	1066,8	711,2	762,0	698,5
28	16	711,2	406,4	520,7	457,2	42	26	1066,8	660,4	762,0	698,5
28	14	711,2	355,6	520,7	457,2	42	24	1066,8	609,6	762,0	660,4
28	12	711,2	323,9	520,7	447,7	42	22	1066,8	558,8	762,0	660,4
30	28	762,0	711,2	558,8	546,1	42	20	1066,8	508,0	762,0	660,4
30	26	762,0	660,4	558,8	546,1	42	18	1066,8	457,2	762,0	647,7
30	24	762,0	609,6	558,8	533,4	42	16	1066,8	406,4	762,0	635,0
30	22	762,0	558,8	558,8	520,7	44	42	1117,6	1066,8	812,8	762,0
30	20	762,0	508,0	558,8	508,0	44	40	1117,6	1016,0	812,8	749,3
30	18	762,0	457,2	558,8	495,3	44	38	1117,6	965,2	812,8	736,6
30	16	762,0	406,4	558,8	482,6	44	36	1117,6	914,4	812,8	723,9
30	14	762,0	355,6	558,8	482,6	44	34	1117,6	863,6	812,8	723,9
30	12	762,0	323,9	558,8	473,1	44	32	1117,6	812,8	812,8	711,2
30	10	762,0	273,1	558,8	460,4	44	30	1117,6	762,0	812,8	711,2
32	30	812,8	762,0	596,9	584,2	44	26	1117,6	660,4	812,8	698,5
32	28	812,8	711,2	596,9	571,5	44	24	1117,6	609,6	812,8	698,5
32	26	812,8	660,4	596,9	571,5	44	22	1117,6	558,8	812,8	685,8
32	24	812,8	609,6	596,9	558,8	44	20	1117,6	508,0	812,8	685,8
32	22	812,8	558,8	596,9	546,1	46	44	1168,4	1117,6	850,9	800,1
32	20	812,8	508,0	596,9	533,4	46	42	1168,4	1066,8	850,9	787,4
32	18	812,8	457,2	596,9	520,7	46	40	1168,4	1016,0	850,9	774,7
32	16	812,8	406,4	596,9	508,0	46	38	1168,4	965,2	850,9	762,0
32	14	812,8	355,6	596,9	508,0	46	36	1168,4	914,4	850,9	762,0
34	32	863,6	812,8	635,0	622,3	46	34	1168,4	863,6	850,9	749,3
34	30	863,6	762,0	635,0	609,6	46	32	1168,4	812,8	850,9	749,3
34	28	863,6	711,2	635,0	596,9	46	30	1168,4	762,0	850,9	736,6
34	26	863,6	660,4	635,0	596,9	46	26	1168,4	660,4	850,9	736,6
34	24	863,6	609,6	635,0	584,2	46	24	1168,4	609,6	850,9	723,9
34	22	863,6	558,8	635,0	571,5	46	22	1168,4	558,8	850,9	723,9
34	20	863,6	508,0	635,0	558,8	48	46	1219,2	1168,4	889,0	838,2
34	18	863,6	457,2	635,0	546,1	48	44	1219,2	1117,6	889,0	838,2
34	16	863,6	406,4	635,0	533,4	48	42	1219,2	1066,8	889,0	812,8
36	34	914,4	863,6	673,1	660,4	48	40	1219,2	1016,0	889,0	812,8
36	32	914,4	812,8	673,1	647,7	48	38	1219,2	965,2	889,0	812,8
36	30	914,4	762,0	673,1	635,0	48	36	1219,2	914,4	889,0	787,4
36	28	914,4	711,2	673,1	622,3	48	34	1219,2	863,6	889,0	787,4
36	26	914,4	660,4	673,1	622,3	48	32	1219,2	812,8	889,0	787,4
36	24	914,4	609,6	673,1	609,6	48	30	1219,2	762,0	889,0	762,0
36	22	914,4	558,8	673,1	596,9	48	26	1219,2	660,4	889,0	762,0
36	20	914,4	508,0	673,1	584,2	48	24	1219,2	609,6	889,0	736,6
36	18	914,4	457,2	673,1	571,5	48	22	1219,2	558,8	889,0	736,6
36	16	914,4	406,4	673,1	558,8	50	48	1270	1219,2	933,5	876,3
38	36	965,2	914,4	711,2	711,2	50	42	1270	1066,8	933,5	838,2
38	34	965,2	863,6	711,2	698,5	50	36	1270	914,4	933,5	825,5
38	32	965,2	812,8	711,2	685,8	50	30	1270	762	933,5	800,1
38	30	965,2	762,0	711,2	673,1	50	24	1270	609,6	933,5	762
38	28	965,2	711,2	711,2	647,7	50	20	1270	508	933,5	762
38	26	965,2	660,4	711,2	647,7	52	50	1320	1270	977,9	908,1
38	24	965,2	609,6	711,2	635,0	52	48	1320	1219,2	977,9	908,1
38	22	965,2	558,8	711,2	622,3	52	42	1320	1066,8	977,9	876,3
38	20	965,2	508,0	711,2	609,6	52	36	1320	914,4	977,9	863,6
38	18	965,2	457,2	711,2	596,9	52	30	1320	762	977,9	831,9

ASME B16.9/ MSS SP-75

BUTT-WELD FITTINGS

REDUCING OUTLET TEES (dimensions in mm) - continued

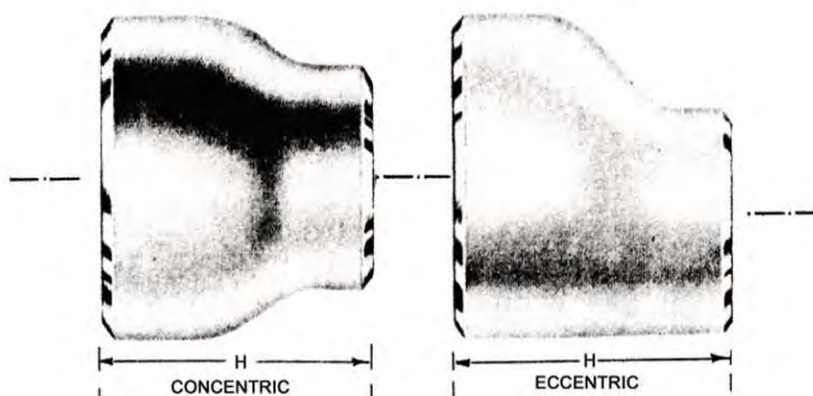
ASME B16.9						MSS SP-75					
NPS		O.D. AT BEVEL		RUN	OUTLET	NPS		O.D. AT BEVEL		RUN	OUTLET
RUN	OUTLET	RUN	OUTLET	C	M	RUN	OUTLET	RUN	OUTLET	C	M
40	38	1016,0	965,2	749,3	749,3	52	24	1320	609,6	977,9	793,8
40	36	1016,0	914,4	749,3	736,6	54	52	1371,6	1320	1016	946,2
40	34	1016,0	863,6	749,3	723,9	54	48	1371,6	1219,2	1016	946,2
40	32	1016,0	812,8	749,3	711,2	54	42	1371,6	1066,8	1016	905
40	30	1016,0	762,0	749,3	698,5	54	36	1371,6	914,4	1016	889
40	28	1016,0	711,2	749,3	673,1	54	30	1371,6	762	1016	863,6
40	26	1016,0	660,4	749,3	673,1	54	24	1371,6	609,6	1016	797,1
40	24	1016,0	609,6	749,3	660,4	56	52	1422,4	1371,6	1054,1	977,9
40	22	1016,0	558,8	749,3	647,7	56	48	1422,4	1219,2	1054,1	939,8
40	20	1016,0	508,0	749,3	635,0	56	42	1422,4	1066,8	1054,1	927,1
40	18	1016,0	457,2	749,3	622,3	56	36	1422,4	914,4	1054,1	901,7
42	36	1066,8	914,4	762,0	711,2	56	30	1422,4	762	1054,1	857,3
42	34	1066,8	863,6	762,0	711,2	56	24	1422,4	609,6	1054,1	857,3
42	32	1066,8	812,8	762,0	711,2	58	56	1473,2	1422,4	1092,2	1016
42	30	1066,8	762,0	762,0	711,2	58	54	1473,2	1371,6	1092,2	1016
42	28	1066,8	711,2	762,0	698,5	58	48	1473,2	1219,2	1092,2	977,9
42	26	1066,8	660,4	762,0	698,5	58	42	1473,2	1066,8	1092,2	952,5
42	24	1066,8	609,6	762,0	660,4	58	36	1473,2	914,4	1092,2	927,1
42	22	1066,8	558,8	762,0	660,4	58	30	1473,2	762	1092,2	889
42	20	1066,8	508,0	762,0	660,4	60	58	1524	1473,2	1117,6	1054,1
42	18	1066,8	457,2	762,0	647,7	60	54	1524	1371,6	1117,6	1028,7
42	16	1066,8	406,4	762,0	635,0	60	48	1524	1219,2	1117,6	1016
44	42	1117,6	1066,8	812,8	762,0	60	42	1524	1066,8	1117,6	990,6
44	40	1117,6	1016,0	812,8	749,3	60	36	1524	914,4	1117,6	965,2
44	38	1117,6	965,2	812,8	736,6	60	30	1524	762	1117,6	914,4
44	36	1117,6	914,4	812,8	723,9						
44	34	1117,6	863,6	812,8	723,9						
44	32	1117,6	812,8	812,8	711,2						
44	30	1117,6	762,0	812,8	711,2						
44	28	1117,6	711,2	812,8	698,5						
44	26	1117,6	660,4	812,8	698,5						
44	24	1117,6	609,6	812,8	698,5						
44	22	1117,6	558,8	812,8	685,8						
44	20	1117,6	508,0	812,8	685,8						
46	44	1168,4	1117,6	850,9	800,1						
46	42	1168,4	1066,8	850,9	787,4						
46	40	1168,4	1016,0	850,9	774,7						
46	38	1168,4	965,2	850,9	762,0						
46	36	1168,4	914,4	850,9	762,0						
46	34	1168,4	863,6	850,9	749,3						
46	32	1168,4	812,8	850,9	749,3						
46	30	1168,4	762,0	850,9	736,6						
46	28	1168,4	711,2	850,9	736,6						
46	26	1168,4	660,4	850,9	736,6						
46	24	1168,4	609,6	850,9	723,9						
46	22	1168,4	558,8	850,9	723,9						
48	46	1219,2	1168,4	889,0	838,2						
48	44	1219,2	1117,6	889,0	838,2						
48	42	1219,2	1066,8	889,0	812,8						
48	40	1219,2	1016,0	889,0	812,8						
48	38	1219,2	965,2	889,0	812,8						
48	36	1219,2	914,4	889,0	787,4						
48	34	1219,2	863,6	889,0	787,4						
48	32	1219,2	812,8	889,0	787,4						
48	30	1219,2	762,0	889,0	762,0						
48	28	1219,2	711,2	889,0	762,0						
48	26	1219,2	660,4	889,0	762,0						
48	24	1219,2	609,6	889,0	736,6						
48	22	1219,2	558,8	889,0	736,6						

BUTT-WELD FITTINGS

Reducers

ASME B16.9/ MSS SP-75

Concentric and eccentric reducers
同心、偏心大小头



REDUCERS (dimensions in mm)

ASME B16.9					MSS SP-75					ASME B16.9					MSS SP-75				
NPS		O.D. AT BEVEL			NPS		O.D. AT BEVEL			NPS		O.D. AT BEVEL			NPS		O.D. AT BEVEL		
L.E.	S.E.	L.E.	S.E.	H	L.E.	S.E.	L.E.	S.E.	H	L.E.	S.E.	L.E.	S.E.	H	L.E.	S.E.	L.E.	S.E.	H
3/4	3/8	26,7	17,2	38,1	16	14	406,4	355,6	355,6	5	4	141,3	114,3	127,1	32	28	812,8	711,2	609,6
3/4	1/2	26,7	21,3	38,1	16	12	406,4	323,9	355,6	5	3 1/2	141,3	101,6	127,0	32	26	812,8	660,4	609,6
1	3/4	33,4	26,7	50,8	16	10	406,4	273,1	355,6	5	3	141,3	88,9	127,0	32	24	812,8	609,6	609,6
1	1/2	33,4	21,3	50,8	16	8	406,4	219,1	355,6	5	2 1/2	141,3	73,0	127,0	34	30	863,6	762,0	609,6
1 1/4	1	42,2	33,4	50,8	18	16	457,2	406,4	381,0	5	2	141,3	60,3	127,0	34	26	863,6	660,4	609,6
1 1/4	3/4	42,2	26,7	50,8	18	14	457,2	355,6	381,0	6	5	168,3	141,3	139,7	34	24	863,6	609,6	609,6
1 1/4	1/2	42,2	21,3	50,8	18	12	457,2	323,9	381,0	6	4	168,3	114,3	139,7	36	34	914,4	863,6	609,6
1 1/2	1 1/4	48,3	42,2	63,5	18	10	457,2	273,1	381,0	6	3 1/2	168,3	101,6	139,7	36	30	914,4	762,0	609,6
1 1/2	1	48,3	33,4	63,5	20	18	508,0	457,2	508,0	6	3	168,3	88,9	139,7	36	26	914,4	660,4	609,6
1 1/2	3/4	48,3	26,7	63,5	20	16	508,0	406,4	508,0	6	2 1/2	168,3	73,0	139,7	36	24	914,4	609,6	609,6
1 1/2	1/2	48,3	21,3	63,5	20	14	508,0	355,6	508,0	8	6	219,1	168,3	152,4	38	36	965,2	914,4	609,6
2	1 1/2	60,3	48,3	76,2	20	12	508,0	323,9	508,0	8	5	219,1	141,3	152,4	38	34	965,2	863,6	609,6
2	1 1/4	60,3	42,2	76,2	22	20	558,8	508,0	508,0	8	4	219,1	114,3	152,4	38	32	965,2	812,8	609,6
2	1	60,3	33,4	76,2	22	18	558,8	457,2	508,0	8	3 1/2	219,1	101,6	152,4	38	30	965,2	762,0	609,6
2	3/4	60,3	26,7	76,2	22	16	558,8	406,4	508,0	10	8	273,1	219,1	177,8	38	26	965,2	660,4	609,6
2 1/2	2	73,0	60,3	88,9	22	14	558,8	355,6	508,0	10	6	273,1	168,3	177,8	38	24	965,2	609,6	609,6
2 1/2	1 1/2	73,0	48,3	88,9	24	22	609,6	558,8	508,0	10	5	273,1	141,3	177,8	38	22	965,2	558,8	609,6
2 1/2	1 1/4	73,0	42,2	88,9	24	20	609,6	508,0	508,0	10	4	273,1	114,3	177,8	38	20	965,2	508,0	609,6
2 1/2	1	73,0	33,4	88,9	24	18	609,6	457,2	508,0	12	10	323,9	273,1	203,2	40	38	1016,0	965,2	609,6
3	2 1/2	88,9	73,0	88,9	24	16	609,6	406,4	508,0	12	8	323,9	219,1	203,2	40	36	1016,0	914,4	609,6
3	2	88,9	60,3	88,9	26	24	660,4	609,6	609,6	12	6	323,9	168,3	203,2	40	34	1016,0	863,6	609,6
3	1 1/2	88,9	48,3	88,9	26	22	660,4	558,8	609,6	12	5	323,9	141,3	203,2	40	32	1016,0	812,8	609,6
3	1 1/4	88,9	42,2	88,9	26	20	660,4	508,0	609,6	14	12	355,6	323,9	330,2	40	30	1016,0	762,0	609,6
3 1/2	3	101,6	88,9	101,6	26	18	660,4	457,2	609,6	14	10	355,6	273,1	330,2	40	26	1016,0	660,4	609,6
3 1/2	2 1/2	101,6	73,0	101,6	28	26	711,2	660,4	609,6	14	8	355,6	219,1	330,2	40	24	1016,0	609,6	609,6
3 1/2	2	101,6	60,3	101,6	28	24	711,2	609,6	609,6	14	6	355,6	168,3	330,2	40	22	1016,0	558,8	609,6
3 1/2	1 1/2	101,6	48,3	101,6	28	22	711,2	558,8	609,6	16	14	406,4	355,6	355,6	40	20	1016,0	508,0	609,6
3 1/2	1 1/4	101,6	42,2	101,6	28	20	711,2	508	609,6	16	12	406,4	323,9	355,6	42	36	1066,8	914,4	609,6
4	3 1/2	114,3	101,6	101,6	28	18	711,2	457,2	609,6	16	10	406,4	273,1	355,6	42	34	1066,8	863,6	609,6
4	3	114,3	88,9	101,6	30	26	762,0	660,4	609,6	16	8	406,4	219,1	355,6	42	32	1066,8	812,8	609,6
4	2 1/2	114,3	73,0	101,6	30	24	762,0	609,6	609,6	18	16	457,2	406,4	381,0	42	30	1066,8	762,0	609,6
4	2	114,3	60,3	101,6	30	20	762,0	508,0	609,6	18	14	457,2	355,6	381,0	42	26	1066,8	660,4	609,6
4	1 1/2	114,3	48,3	101,6	32	30	812,8	762	609,6	18	12	457,2	323,9	381,0	42	24	1066,8	609,6	609,6
										18	10	457,2	273,1	381,0	44	42	1117,6	1066,8	609,6

NOTE: LE = Large End
SE = Small End

ASME B16.9/ MSS SP-75

BUTT-WELD FITTINGS

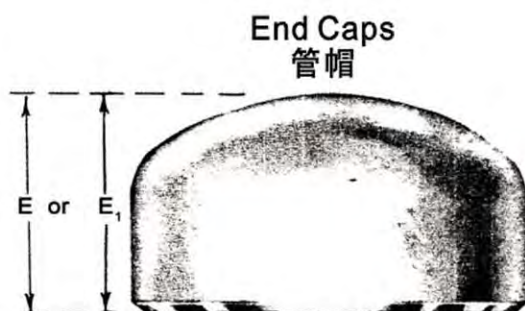
REDUCERS (dimensions in mm) - continued

ASME B16.9					MSS SP-75					ASME B16.9					MSS SP-75				
NPS		O.D. AT BEVEL			NPS		O.D. AT BEVEL			NPS		O.D. AT BEVEL			NPS		O.D. AT BEVEL		
L.E.	S.E.	L.E.	S.E.	H	L.E.	S.E.	L.E.	S.E.	H	L.E.	S.E.	L.E.	S.E.	H	L.E.	S.E.	L.E.	S.E.	H
20	18	508,0	457,2	508,0	44	40	1117,6	1016,0	609,6	42	40	1066,8	1016,0	609,6	56	54	1422,4	1371,6	711,2
20	16	508,0	406,4	508,0	44	38	1117,6	965,2	609,6	42	38	1066,8	965,2	609,6	56	48	1422,4	1219,2	711,2
20	14	508,0	355,6	508,0	44	36	1117,6	914,4	609,6	42	36	1066,8	914,4	609,6	56	42	1422,4	1066,8	711,2
20	12	508,0	323,9	508,0	44	34	1117,6	863,6	609,6	42	34	1066,8	863,6	609,6	56	36	1422,4	914,4	711,2
22	20	558,8	508,0	508,0	44	32	1117,6	812,8	609,6	42	32	1066,8	812,8	609,6	56	30	1422,4	762	711,2
22	18	558,8	457,2	508,0	44	30	1117,6	762,0	609,6	42	30	1066,8	762,0	609,6	56	24	1422,4	609,6	711,2
22	16	558,8	406,4	508,0	44	26	1117,6	660,4	609,6	44	42	1117,6	1066,8	609,6	58	56	1473,2	1422,4	711,2
22	14	558,8	355,6	508,0	44	24	1117,6	609,6	609,6	44	40	1117,6	1016,0	609,6	58	54	1473,2	1371,6	711,2
24	22	609,6	558,8	508,0	44	22	1117,6	558,8	609,6	44	38	1117,6	965,2	609,6	58	48	1473,2	1219,2	711,2
24	20	609,6	508,0	508,0	46	44	1168,4	1117,6	711,2	44	36	1117,6	914,4	609,6	58	42	1473,2	1066,8	711,2
24	18	609,6	457,2	508,0	46	42	1168,4	1066,8	711,2	46	44	1168,4	1117,6	711,2	58	36	1473,2	914,4	711,2
24	16	609,6	406,4	508,0	46	40	1168,4	1016,0	711,2	46	42	1168,4	1066,8	711,2	58	30	1473,2	762	711,2
26	24	660,4	609,6	609,6	46	38	1168,4	965,2	711,2	46	40	1168,4	1016,0	711,2	60	58	1524	1473,2	711,2
26	22	660,4	558,8	609,6	46	36	1168,4	914,4	711,2	46	38	1168,4	965,2	711,2	60	54	1524	1371,6	711,2
26	20	660,4	508,0	609,6	46	34	1168,4	863,6	711,2	48	46	1219,2	1168,4	711,2	60	48	1524	1219,2	711,2
26	18	660,4	457,2	609,6	46	32	1168,4	812,8	711,2	48	44	1219,2	1117,6	711,2	60	42	1524	1066,8	711,2
28	26	711,2	660,4	609,6	46	30	1168,4	762,0	711,2	48	42	1219,2	1066,8	711,2	60	36	1524	914,4	711,2
28	24	711,2	609,6	609,6	46	26	1168,4	660,4	711,2	48	40	1219,2	1016,0	711,2	60	30	1524	762	711,2
28	20	711,2	508,0	609,6	46	24	1168,4	609,6	711,2										
28	18	711,2	457,2	609,6	48	46	1219,2	1168,4	711,2										
30	28	762,0	711,2	609,6	48	44	1219,2	1117,6	711,2										
30	26	762,0	660,4	609,6	48	42	1219,2	1066,8	711,2										
30	24	762,0	609,6	609,6	48	40	1219,2	1016,0	711,2										
30	20	762,0	508,0	609,6	48	38	1219,2	965,2	711,2										
32	30	812,8	762,0	609,6	48	36	1219,2	914,4	711,2										
32	28	812,8	711,2	609,6	48	34	1219,2	863,6	711,2										
32	26	812,8	660,4	609,6	48	32	1219,2	812,8	711,2										
32	24	812,8	609,6	609,6	48	30	1219,2	762,0	711,2										
34	32	863,6	812,8	609,6	48	26	1219,2	660,4	711,2										
34	30	863,6	762,0	609,6	48	24	1219,2	609,6	711,2										
34	26	863,6	660,4	609,6	50	48	1320	1270	711,2										
34	24	863,6	609,6	609,6	50	42	1320	1219,2	711,2										
36	34	914,4	863,6	609,6	50	36	1320	1066,8	711,2										
36	32	914,4	812,8	609,6	50	30	1320	914,4	711,2										
36	30	914,4	762,0	609,6	50	24	1320	762	711,2										
36	26	914,4	660,4	609,6	50	20	1320	609,6	711,2										
36	24	914,4	609,6	609,6	52	50	1320	1270	711,2										
38	36	965,2	914,4	609,6	52	48	1320	1219,2	711,2										
38	34	965,2	863,6	609,6	52	42	1320	1066,8	711,2										
38	32	965,2	812,8	609,6	52	36	1320	914,4	711,2										
38	30	965,2	762,0	609,6	52	30	1320	762	711,2										
38	28	965,2	711,2	609,6	52	24	1320	609,6	711,2										
38	26	965,2	660,4	609,6	54	52	1371,6	1320	711,2										
40	38	1016,0	965,2	609,6	54	48	1371,6	1219,2	711,2										
40	36	1016,0	914,4	609,6	54	42	1371,6	1066,8	711,2										
40	34	1016,0	863,6	609,6	54	36	1371,6	914,4	711,2										
40	32	1016,0	812,8	609,6	54	30	1371,6	762	711,2										
40	30	1016,0	762,0	609,6	54	24	1371,6	609,6	711,2										

NOTE: LE = Large End
SE = Small End

BUTT-WELD FITTINGS

ASME B16.9/ MSS SP-75



END CAPS (dimensions in mm)

ASME B16.9					MSS SP-75				
NPS	O.D. AT BEVEL	# E	LIMITING W.T. FOR LENGTH E	E ₁	NPS	O.D. AT BEVEL	# E	LIMITING W.T. FOR LENGTH E	E ₁
1/2	21,3	25,4	3,7	25,4	16	406,4	177,8	25,4	203,2
3/4	26,7	25,4	3,9	25,4	18	457,2	203,2	25,4	228,6
1	33,4	38,1	4,6	38,1	20	508,0	228,6	25,4	254,0
1 1/4	42,2	38,1	4,9	38,1	22	558,8	254,0	25,4	254,0
1 1/2	48,3	38,1	5,1	38,1	24	609,6	266,7	25,4	304,8
2	60,3	38,1	5,5	44,5	26	660,4	266,7	25,4	304,8
2 1/2	73,0	38,1	7,0	50,8	28	711,2	266,7	25,4	304,8
3	88,9	50,8	7,6	63,5	30	762,0	266,7	25,4	304,8
3 1/2	101,6	63,5	8,1	76,2	32	812,8	266,7	25,4	304,8
4	114,3	63,5	8,6	76,2	34	863,6	266,7	25,4	304,8
5	141,3	76,2	9,5	88,9	36	914,4	266,7	25,4	304,8
6	168,3	88,9	11,0	101,6	38	965,2	304,8	25,4	342,9
8	219,1	101,6	12,7	127,0	40	1016,0	304,8	25,4	342,9
10	273,1	127,0	12,7	152,4	42	1066,8	304,8	25,4	342,9
12	323,9	152,4	12,7	177,8	44	1117,6	342,9	25,4	381,0
14	355,6	165,1	12,7	190,5	46	1168,4	342,9	25,4	381,0
16	406,4	177,8	12,7	203,2	48	1219,2	342,9	25,4	381,0
18	457,2	203,2	12,7	228,6	50	1270	368,3	25,4	406,4
20	508,0	228,6	12,7	254,0	52	1320	368,3	25,4	406,4
22	558,8	254,0	12,7	254,0	54	1371,6	406,4	25,4	444,5
24	609,6	266,7	12,7	304,8	56	1422,4	406,4	25,4	444,5
26	660,4	266,7	-	-	58	1473,2	419,1	25,4	457,2
28	711,2	266,7	-	-	60	1524	419,1	25,4	457,2
30	762,0	266,7	-	-					
32	812,8	266,7	-	-					
34	863,6	266,7	-	-					
36	914,4	266,7	-	-					
38	965,2	304,8	-	-					
40	1016,0	304,8	-	-					
42	1066,8	304,8	-	-					
44	1117,6	342,9	-	-					
46	1168,4	342,9	-	-					
48	1219,2	342,9	-	-					

*The shape of these caps shall be ellipsoidal and shall conform to the shape requirements as given in ASME Boiler and Pressure Vessel Code.

#Length E applies for thickness not exceeding that given in column "Limiting Wall Thickness for Length E".

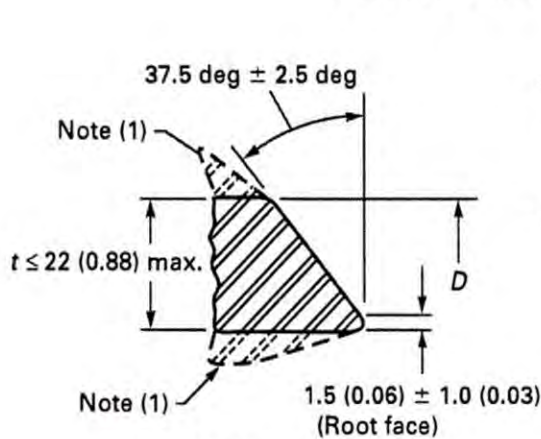
Length E₁ applies for thickness greater than that given in column "Limiting Wall Thickness" for sizes 24 in. and smaller. For sizes 26 in. and larger, length E₁ shall be by agreement between manufacturer and purchaser.

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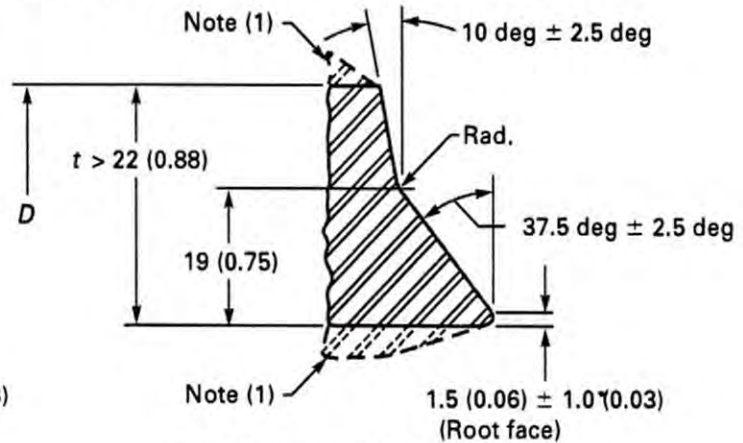
BUTT-WELD FITTINGS

ASME B16.9

Welding Bevels and Root Face



(a) Plain Bevel



(b) Compound Bevel

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

GENERAL NOTES:

(a) Dimensions in parentheses are in inches.

(b) Other dimensions are in millimeters.

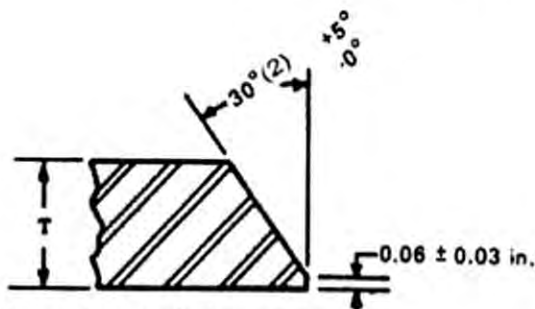
NOTES:

(1) See section 8 and Fig. 1 for transition contours.

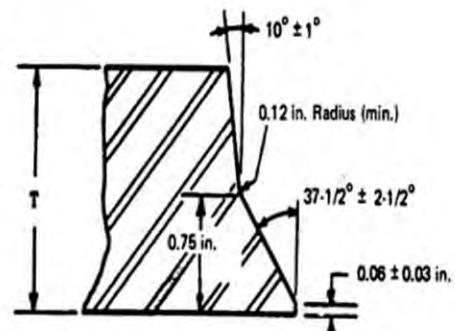
(2) $x = 5$ (0.19) for carbon steel or ferritic alloy steel and 3 (0.12) for austenitic alloy steel.

MSS SP-75

Welding Bevels and Root Face

⁽¹⁾ Or 1 in. at option of the manufacturer.⁽²⁾ Fittings NPS 24 and smaller may be furnished with $37\frac{1}{2}^\circ$ $2\frac{1}{2}^\circ$ bevel at option of the manufacturer.

RECOMMENDED BEVEL FOR WALL THICKNESSES (T) AT END OF FITTING, 0.75 IN. ⁽¹⁾ OR LESS

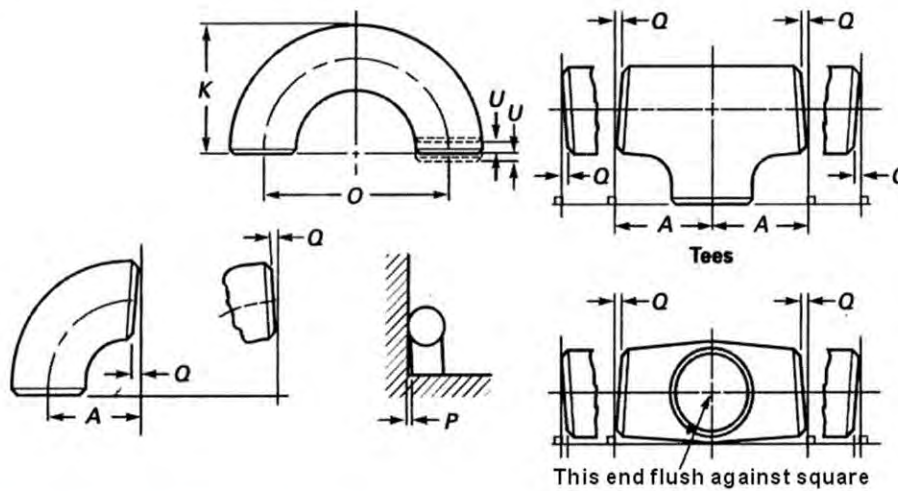


RECOMMENDED BEVEL FOR WALL THICKNESSES (T) AT END OF FITTING, GREATER THAN 0.75 IN.

BUTT-WELD FITTINGS

ASME B16.9

Tolerances



All Fittings [Notes (1) and (2)]				Center-to-End Dimensions		Overall Length of Reducers and Lap joint Stub Ends, F, H	Overall Length of Caps, E	180-deg Returns		
Nominal Pipe Size (NPS)	DN	Outside Diameter at Bevel, D [Notes (3) and (4)]	Inside Diameter at End [Notes (3) and (5)]	90-deg and 45-deg Long and Short Radius Elbows and Tees, A, B, C, M	3D Radius Elbows, A, B			Center-to-Center Dimension, O	Back-to-Face Dimension, K	Alignment of Ends, U
½ to 2½	15-65	+1.6, -0.8	0.8	2	3	2	3	6	6	1
3 to 3½	80-90	1.6	1.6	2	3	2	3	6	6	1
4	100	1.6	1.6	2	3	2	3	6	6	1
5 to 8	125-200	+2.4, -1.6	1.6	2	3	2	6	6	6	1
10 to 18	250-450	+4.0, -3.2	3.2	2	3	2	6	10	6	2
20 to 24	500-600	+6.4, -4.8	4.8	2	3	2	6	10	6	2
26 to 30	650-750	+6.4, -4.8	4.8	3	6	5	10	...	...	...
32 to 48	800-1 200	+6.4, -4.8	4.8	5	6	5	10	...	...	...

Nominal Pipe Size (NPS)	DN	Lap Joint Stub Ends [Note (6)]			Nominal Pipe Size (NPS)	DN	Angularity Tolerances	
		Outside Diameter of Lap, G	Fillet Radius of Lap, R	Lap Thickness			Off Angle, Q	Off Plane, P
½ to 2½	15-65	+0, -1	+0, -1	+1.6, -0	½ to 4	15-100	1	2
3 to 3½	80-90	+0, -1	+0, -1	+1.6, -0	5 to 8	125-200	2	4
4	100	+0, -1	+0, -2	+1.6, -0	10 to 12	250-300	3	5
5 to 8	125-200	+0, -1	+0, -2	+1.6, -0	14 to 16	350-400	3	6
10 to 18	250-450	+0, -2	+0, -2	+3.2, -0	18 to 24	450-600	4	10
20 to 24	500-600	+0, -2	+0, -2	+3.2, -0	26 to 30	650-750	5	10
26 to 30	650-750	...	...	...	32 to 42	800-1050	5	13
32 to 48	800-1200	...	...	...	44 to 48	1100-1200	5	19

GENERAL NOTES:

- (a) All dimensions are in millimeters.
 (b) Tolerances are equal plus and minus except as noted.

NOTES:

- (1) The inside diameter and the nominal wall thicknesses at ends are to be specified by the purchaser.
 (2) A minimum wall thickness of 87.5% applies unless the purchaser specifies a different wall thickness tolerance. See Fig. 1, Note (1)(a).
 (3) Out-of-round is the sum of absolute values of plus and minus tolerances.
 (4) This tolerance may not apply in localized areas of formed fittings where increased wall thickness is required to meet design requirements of para. 2.2.
 (5) Unless otherwise specified by the purchaser, these tolerances apply to the nominal inside diameter, which equals the difference between the nominal outside diameter and twice the nominal wall thickness.
 (6) See Table 9 for limiting dimensions of outside diameter of barrel.

MSS SP-75

BUTT-WELD FITTINGS

TOLERANCE FOR MSS SP-75

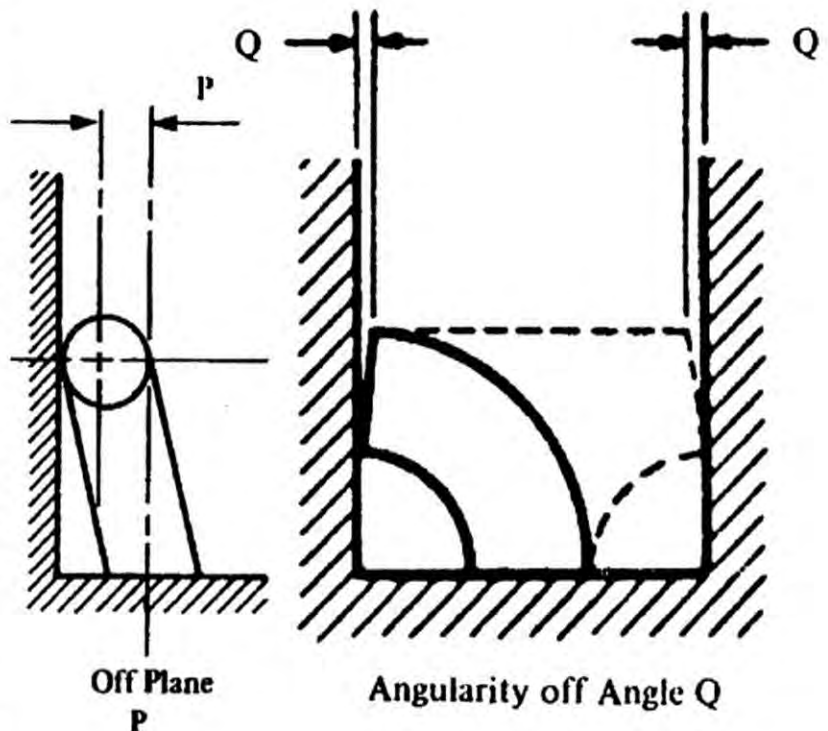
NPS	Inside ⁽¹⁾ Diameter At End	Minimum Wall Thickness	Out-of-Roundness ⁽²⁾			90°, 60°, 45° & 30° Elbows & Tees Center-to-End Dimension A, B, Z, M		Reducers Overall Length H	Caps Overall Length E	Angularity Off Angle Q	Elbows Off Plane P	Eccentric And Con- centric Reducers Off Plane P ⁽⁶⁾
			At Ends of Fittings		Throughout ⁽⁴⁾ Body of Elbows	1-1/2 R & Tee	3R					
			Elbows ⁽⁵⁾	Other								
16-24	±0.09	Nominal	0.19	0.12	2.5%	± 0.09	±0.12	± 0.09	±0.25	0.09	0.25	2.5%
26-36	± 0.09	-0.01	(5)	0.12	2.5%	±0.12	±0.25	±0.19	±0.38	0.09	0.50	2.5%
38-48	±0.12		(5)	0.12	2.5%	±0.19	±0.38	±0.38	±0.38	0.12	0.75	2.5%
50-60	±0.25		(5)	0.19	2.5%	± 0.25	±0.38	±0.38	±0.38	0.19	0.75	2.5%

NOTE:

- (1) The inside diameter at end shall be determined by circumferential measurements, and the tolerance refers to variations from nominal I.D. calculation by (OD nom²/nom).
- (2) Out-of-roundness tolerances shall be the difference between the maximum and minimum diameters measured on any radial cross-section.
- (3) Minus 0.01 in except that isolated non-continuous reductions are permitted in accordance with Section 13.2. Excess thickness whether on inside or outside is to be treated in accordance with sketches given in Figure 3.
- (4) When elbows are intended for field segmenting, out-of-roundness tolerance may be furnished to 1% by agreement between the Manufacturer and the Purchaser. It is recognized that extra thickness, if any, may be on the I.D.
- (5) Out-of-roundness tolerances at ends shall be 1% of diameter for NPS 26 and larger.
- (6) Percent of O.D.

NOTE:

Outside diameter may be tapered at angle up to 30° beyond weld bevel.



WEIGHT OF FITTING 管件重量表

90° ELBOWS, BUTT WELDING PIPE FITTINGS (LONG RADIUS)

NPS	DN	APPROXIMATE WEIGHT IN KGS												
INCHES	METRIC	SCH 10	SCH 20	SCH 30	STD	SCH 40	SCH 60	XS	SCH 80	SCH 100	SCH 120	SCH 140	SCH 160	XXS
1/2	15				0.06	0.06		0.09	0.09				0.15	0.17
3/4	20				0.07	0.07		0.10	0.10				0.17	0.20
1	25				0.15	0.15		0.19	0.19				0.27	0.34
1 1/4	32				0.26	0.26		0.34	0.34				0.44	0.61
1 1/2	40				0.38	0.38		0.48	0.48				0.68	0.90
2	50				0.68	0.68		0.91	0.91				1.40	1.68
2 1/2	65				1.30	1.30		1.73	1.73				2.34	3.20
3	80				2.08	2.08		2.78	2.78				4.02	5.17
3 1/2	90				2.92	2.92		3.96	3.96					
4	100				3.95	3.95		5.40	5.40		7.11		8.42	10.30
5	125				6.67	6.67		9.34	9.34		12.65		15.42	18.10
6	150				10.40	10.40		15.50	15.50		20.42		25.46	29.90
8	200	16.74	18.98	20.90	20.90	26.60	31.30	31.30	38.19	45.46	50.74	55.93	54.40	
10	250	26.22	32.79	37.00	37.00	49.40	49.40	60.31	71.82	83.54	97.41	108.19	97.41	
12	300		37.46	49.72	54.00	60.70	82.26	71.20	99.36	120.27	140.87	156.82	179.90	140.87
14	350	48.09	59.70	69.90	69.90	83.06	111.49	91.60	138.68	171.23	197.54	222.96	247.70	
16	400	62.95	78.20	91.20	91.20	120.20	161.29	120.20	204.17	246.85	288.05	334.83	367.15	
18	450	79.82	99.20	131.15	116.10	176.21	232.70	153.30	287.57	350.64	411.21	461.77	519.59	
20	500	98.67	143.80	190.10	143.80	229.96	311.02	190.10	391.03	478.71	554.58	638.27	717.50	
22	550	119.54	174.60	230.40	174.60		406.26	230.40	516.35	623.36	727.94	829.61	939.80	
24	600	142.40	207.70	300.63	207.70	384.10	534.95	274.90	664.71	825.23	964.10	1101.62	1251.54	
26	650	208.10	323.40		249.00			326.00						
28	700	241.56	385.00	455.86	290.00			380.00						
30	750	277.51	452.30	524.10	333.00	680.00		442.00						
32	800	315.95	511.00	597.11	386.00	778.00		495.00						
34	850	356.88	557.90	674.87	428.00	951.00		550.00						
36	900	400.31	626.00	757.38	480.00			626.00						
38	950				544.00			710.00						
40	1000				594.00			790.00						
42	1050				656.00			852.00						
44	1100				726.00			975.00						
46	1150				786.00			1020.00						
48	1200				860.00			1134.00						

45° ELBOWS, BUTT WELDING PIPE FITTINGS (LONG RADIUS)

NPS	DN	APPROXIMATE WEIGHT IN KGS												
INCHES	METRIC	SCH 10	SCH 20	SCH 30	STD	SCH 40	SCH 60	XS	SCH 80	SCH 100	SCH 120	SCH 140	SCH 160	XXS
1/2	15				0.03	0.03		0.05	0.05				0.08	0.09
3/4	20				0.04	0.04		0.05	0.05				0.09	0.10
1	25				0.08	0.08		0.10	0.10				0.14	0.17
1 1/4	32				0.13	0.13		0.17	0.17				0.22	0.31
1 1/2	40				0.19	0.19		0.24	0.24				0.34	0.45
2	50				0.34	0.34		0.46	0.46				0.70	0.84
2 1/2	65				0.65	0.65		0.87	0.87				1.17	1.60
3	80				1.04	1.04		1.39	1.39				2.01	2.59
3 1/2	90				1.46	1.46		1.98	1.98					
4	100				1.98	1.98		2.70	2.70		3.56		4.21	5.15
5	125				3.34	3.34		4.67	4.67		6.33		7.71	9.05
6	150				5.20	5.20		7.75	7.75		10.21		12.73	14.95
8	200		8.37	9.49	10.45	10.45	13.30	15.65	15.65	19.10	22.73	25.37	27.97	27.20
10	250		13.11	16.40	18.50	18.50	24.70	24.70	30.16	35.91	41.77	48.71	54.10	48.71
12	300		18.73	24.86	27.00	30.35	41.13	35.60	49.68	60.14	70.44	78.41	89.95	70.44
14	350	24.05	29.85	34.95	34.95	41.53	55.75	45.80	69.34	85.62	98.77	111.48	123.85	
16	400	31.48	39.10	45.60	45.60	60.10	80.65	60.10	102.09	123.43	144.03	167.42	183.58	
18	450	39.91	49.60	65.58	58.05	88.11	116.35	76.65	143.79	175.32	205.61	230.89	259.80	
20	500	49.34	71.90	95.05	71.90	114.98	155.51	95.05	195.52	239.36	277.29	319.14	358.75	
22	550	59.77	87.30	115.20	87.30		203.13	115.20	258.18	311.68	363.97	414.81	469.90	
24	600	71.20	103.85	150.32	103.85	192.05	267.48	137.45	332.36	412.62	482.05	550.81	625.77	
26	650	104.05	161.70		125.00			163.00						
28	700	120.78	192.50	227.93	145.00			190.00						
30	750	138.76	226.15	262.05	167.00	344.00		221.00						
32	800	157.98	255.50	298.56	193.00	389.00		248.00						
34	850	178.44	278.95	337.44	214.00	476.00		275.00						
36	900	200.16	313.00	378.69	240.00			313.00						
38	950				272.00			355.00						
40	1000				297.00			395.00						
42	1050				328.00			426.00						
44	1100				363.00			487.50						
46	1150				393.00			510.00						
48	1200				430.00			567.00						

WEIGHT OF FITTING 管件重量表

90° ELBOWS, BUTT WELDING PIPE FITTINGS (SHORT RADIUS)

NPS	DN	APPROXIMATE WEIGHT IN KGS												
INCHES	METRIC	SCH 10	SCH 20	SCH 30	STD	SCH 40	SCH 60	XS	SCH 80	SCH 100	SCH 120	SCH 140	SCH 160	XXS
1/2	15				0.04	0.04		0.06	0.06					
3/4	20				0.05	0.05		0.07	0.07					
1	25				0.10	0.10		0.13	0.13				0.18	0.23
1 1/4	32				0.17	0.17		0.23	0.23				0.29	0.41
1 1/2	40				0.25	0.25		0.33	0.33				0.45	0.60
2	50				0.45	0.45		0.60	0.60				0.93	1.13
2 1/2	65				0.87	0.87		1.14	1.14				1.56	2.03
3	80				1.38	1.38		1.83	1.83				2.68	3.47
3 1/2	90				1.93	1.93		2.61	2.61					
4	100				2.62	2.62		3.58	3.58		4.74		5.62	6.86
5	125				4.42	4.42		6.21	6.21		8.43		10.28	12.02
6	150				6.89	6.89		10.30	10.30		13.62		16.97	19.90
8	200		11.16	12.37	13.80	13.80	17.70	20.70	20.70	25.46	30.31	33.82	37.29	36.12
10	250		17.48	21.35	24.50	24.50	32.90	32.90	40.21	47.88	55.69	64.94	72.13	64.94
12	300		24.97	32.71	36.10	40.05	54.87	47.20	66.24	80.18	93.91	104.55	119.93	93.91
14	350	32.06	39.80	46.30	46.30	55.37	74.33	61.20	92.68	114.16	131.69	148.64	165.13	
16	400	41.97	52.14	61.20	61.20	80.30	107.52	80.30	136.08	164.57	192.03	223.22	244.77	
18	450	53.21	66.13	92.36	77.60	117.48	155.13	102.10	191.71	233.76	274.14	307.85	346.39	
20	500	65.78	96.20	126.10	96.20	153.31	207.35	126.10	260.68	319.14	369.72	425.51	478.50	
22	550	79.69	117.00	154.20	117.00		270.84	154.20	344.24	415.57	485.29	553.08	626.70	
24	600	94.93	138.30	210.41	138.30	256.07	356.63	183.30	443.95	550.15	642.73	734.42	834.76	
26	650	138.73	216.80	-	163.80			216.80						
28	700	161.03	258.60	319.26	206.80			258.60						
30	750	185.00	287.60	366.77	217.70	460.00		287.60						
32	800	210.63	342.00	417.86	236.80	545.00		342.00						
34	850	233.00	395.00	493.79	280.00	634.02		395.00						
36	900	266.87	414.10	530.17	313.90			414.10						
38	950				364.70			480.40						
40	1000				395.10			532.10						
42	1050				438.20			590.00						
44	1100				486.30			653.20						
46	1150				547.10			706.70						
48	1200				607.80			759.80						

45° ELBOWS, BUTT WELDING PIPE FITTINGS (SHORT RADIUS)

NPS	DN	APPROXIMATE WEIGHT IN KGS												
INCHES	METRIC	SCH 10	SCH 20	SCH 30	STD	SCH 40	SCH 60	XS	SCH 80	SCH 100	SCH 120	SCH 140	SCH 160	XXS
1/2	15				0.02	0.02		0.03	0.03					
3/4	20				0.03	0.03		0.04	0.04					
1	25				0.05	0.05		0.07	0.07				0.09	0.12
1 1/4	32				0.09	0.09		0.12	0.12				0.15	0.21
1 1/2	40				0.13	0.13		0.17	0.17				0.23	0.30
2	50				0.23	0.23		0.30	0.30				0.47	0.57
2 1/2	65				0.44	0.44		0.57	0.57				0.78	1.02
3	80				0.69	0.69		0.92	0.92				1.34	1.74
3 1/2	90				0.97	0.97		1.31	1.31					
4	100				1.31	1.31		1.79	1.79		2.37		2.81	3.43
5	125				2.21	2.21		3.11	3.11		4.22		5.14	6.01
6	150				3.45	3.45		5.15	5.15		6.81		8.49	9.95
8	200		5.58	6.19	6.90	6.90	8.85	10.35	10.35	12.73	15.16	16.91	18.65	18.06
10	250		8.74	10.68	12.25	12.25	16.45	16.45	20.11	23.94	27.85	32.47	36.07	32.47
12	300		12.49	16.36	18.05	20.03	27.44	23.60	33.12	40.09	46.96	52.28	59.97	46.96
14	350	16.03	19.90	23.15	23.15	27.69	37.17	30.60	46.34	57.08	65.85	74.32	82.57	
16	400	20.99	26.07	30.60	30.60	40.15	53.76	40.15	68.04	82.29	96.02	111.61	122.39	
18	450	26.61	33.07	46.18	38.80	58.74	77.57	51.05	95.86	116.88	137.07	153.93	173.20	
20	500	32.89	48.10	63.05	48.10	76.66	103.68	63.05	130.34	159.57	184.86	212.76	239.25	
22	550	39.85	58.50	77.10	58.50		135.42	77.10	172.12	207.79	242.65	276.54	313.35	
24	600	47.47	69.15	105.21	69.15	128.04	178.32	91.65	221.98	275.08	321.37	367.21	417.38	
26	650	69.37	108.40		81.90			108.40						
28	700	80.52	129.30	159.63	103.40			129.30						
30	750	92.50	143.80	183.39	108.85	230.00		143.80						
32	800	105.32	171.00	208.93	118.40	272.50		171.00						
34	850	116.50	197.50	246.90	140.00	317.01		197.50						
36	900	133.44	207.05	265.09	156.95			207.05						
38	950				182.35			240.20						
40	1000				197.55			266.05						
42	1050				219.10			295.00						
44	1100				243.15			326.60						
46	1150				273.55			353.35						
48	1200				303.90			379.90						

WEIGHT OF FITTING 管件重量表

180° ELBOWS, BUTT WELDING PIPE FITTINGS (LONG RADIUS)

NPS	DN	APPROXIMATE WEIGHT IN KGS												
INCHES	METRIC	SCH 10	SCH 20	SCH 30	STD	SCH 40	SCH 60	XS	SCH 80	SCH 100	SCH 120	SCH 140	SCH 160	XXS
1/2	15				0.12	0.12		0.17	0.17				0.30	0.35
3/4	20				0.14	0.14		0.20	0.20				0.34	0.41
1	25				0.31	0.31		0.40	0.40				0.54	0.68
1 1/4	32				0.53	0.53		0.69	0.69				0.88	1.22
1 1/2	40				0.76	0.76		1.00	1.00				1.36	1.80
2	50				1.36	1.36		1.85	1.85				2.80	3.36
2 1/2	65				2.67	2.67		3.50	3.50				4.68	6.40
3	80				4.19	4.19		5.62	5.62				8.04	10.34
3 1/2	90				5.90	5.90		7.98	7.98					
4	100				7.94	7.94		11.00	11.00		14.22		16.84	20.60
5	125				13.50	13.50		19.00	19.00		25.30		30.84	36.20
6	150				20.90	20.90		31.30	31.30		40.84		50.92	59.80
8	200		33.48	37.96	41.90	41.90	53.32	63.50	63.50	76.38	90.92	101.48	111.86	108.80
10	250		52.44	65.58	74.40	74.40	100.20	100.20	120.62	143.64	167.08	194.82	216.38	194.82
12	300		74.92	99.44	109.30	120.14	164.52	143.80	198.72	240.54	281.74	313.64	359.80	281.74
14	350	96.18	119.4	140.2	140.20	166.12	222.98	184.60	277.36	342.46	395.08	445.92	495.40	
16	400	125.9	156.4	183.7	183.70	242.20	322.58	242.20	408.34	493.70	576.10	669.66	734.30	
18	450	159.64	198.4	275.6	233.10	352.42	465.40	308.00	575.14	701.28	822.42	923.54	1039.18	
20	500	197.34	288.9	381.5	288.90	459.92	622.04	381.50	782.06	957.42	1109.16	1276.54	1435.00	
22	550	239.08	349.7	462.7	349.70		812.52	462.70	1032.70	1246.72	1454.08	1659.22	1879.60	
24	600	284.8	417.3	637.11	417.30	768.20	1069.90	553.40	1329.42	1650.46	1928.20	2203.24	2502.00	

180° ELBOWS, BUTT WELDING PIPE FITTINGS (SHORT RADIUS)

NPS	DN	APPROXIMATE WEIGHT IN KGS												
INCHES	METRIC	SCH 10	SCH 20	SCH 30	STD	SCH 40	SCH 60	XS	SCH 80	SCH 100	SCH 120	SCH 140	SCH 160	XXS
1/2	15				0.08	0.08		0.12	0.12					
3/4	20				1.00	1.00		0.14	0.14					
1	25				0.21	0.21		0.27	0.27				0.36	0.46
1 1/4	32				0.35	0.35		0.46	0.46				0.58	0.82
1 1/2	40				0.50	0.50		0.66	0.66				0.90	1.20
2	50				0.90	0.90		1.23	1.23				1.86	2.26
2 1/2	65				1.78	1.78		2.32	2.32				3.12	4.06
3	80				2.78	2.78		3.72	3.72				5.36	6.94
3 1/2	90				3.90	3.90		5.31	5.31					
4	100				5.26	5.26		7.30	7.30		9.48		11.24	13.72
5	125				8.94	8.94		12.60	12.60		16.86		20.56	24.04
6	150				13.90	13.90		20.70	20.70		27.24		33.94	39.80
8	200		22.32	24.68	27.90	27.90	35.55	42.00	42.00	50.92	60.62	67.64	74.58	72.24
10	250		34.97	42.72	49.40	49.40	66.70	66.70	80.42	95.78	111.38	129.88	144.26	129.88
12	300		49.95	65.50	72.60	80.10	109.68	95.30	132.48	160.37	187.82	209.10	239.86	187.82
14	350	64.12	79.61	93.00	93.00	110.75	148.65	122.90	185.36	228.32	263.38	297.28	330.26	
16	400	83.94	104.28	122.50	122.50	161.00	215.04	161.00	272.17	329.14	384.06	446.44	489.54	
18	450	106.42	132.26	184.38	155.10	234.95	310.26	204.60	383.43	467.53	548.28	615.70	692.78	
20	500	131.56	192.30	254.00	192.30	306.62	414.69	254.00	521.37	638.28	739.44	851.02	957.00	
22	550	159.38	237.58	315.16	237.58		541.69	315.10	688.48	831.14	970.58	1106.16	1255.00	
24	600	189.86	277.60	420.48	277.60	512.13	713.26	367.40	887.91	1100.30	1285.46	1468.84	1668.90	

WEIGHT OF FITTING 管件重量表

EQUAL TEE, RED TEE (ACCORDING TO THE BIGGER END SIZE), BUTT WELDING PIPE FITTINGS

NPS	DN	APPROXIMATE WEIGHT IN KGS												
INCHES	METRIC	SCH 10	SCH 20	SCH 30	STD	SCH 40	SCH 60	XS	SCH 80	SCH 100	SCH 120	SCH 140	SCH 160	XXS
1/2	15				0.16	0.16		0.20	0.20				0.14	0.29
3/4	20				0.20	0.20		0.30	0.30				0.28	0.38
1	25				0.28	0.28		0.45	0.45				0.54	0.58
1 1/4	32				0.53	0.53		0.70	0.70				0.84	1.05
1 1/2	40				0.92	0.92		1.25	1.25				1.34	1.56
2	50				1.48	1.48		2.15	2.15				2.33	2.69
2 1/2	65				2.68	2.68		2.95	2.95				4.22	4.54
3	80				3.76	3.76		4.35	4.35				6.16	7.63
3 1/2	90				4.62	4.62		5.85	5.85					
4	100				6.50	6.50		7.66	7.66		7.62		11.69	12.30
5	125				9.66	9.66		13.50	13.50		12.60		19.22	18.10
6	150				14.00	14.00		19.30	19.30		24.15		29.09	37.60
8	200		19.50	22.32	24.50	24.50	29.82	34.50	34.50	46.43	50.31	56.79	62.34	68.00
10	250		38.60	39.21	41.30	41.30	55.98	58.40	67.50	76.87	96.72	106.59	117.94	97.41
12	300		43.40	61.74	65.00	69.00	88.93	76.50	105.00	135.45	151.13	167.57	188.93	140.87
14	350	40.54	75.00	83.00	83.00	96.00	125.90	104.00	142.00	197.50	213.00	240.64	267.58	
16	400	49.67	99.00	110.00	110.00	120.00	168.68	120.00	187.00	262.95	280.32	331.28	634.31	
18	450	62.8	114.00	147.00	132.00	170.00	243.23	159.00	263.00	356.87	422.51	465.21	517.39	
20	500	86.55	168.00	192.00	168.00	240.00	300.59	192.00	354.00	469.61	577.56	643.12	707.19	
22	550	143.00	185.00	209.00	185.00		411.00	209.00	416.00	725.00	840.00	950.00	1110.00	
24	600	170.00	222.00	332.00	222.00	407.00	573.00	251.00	720.97	910.00	1100.00	1180.00	1310.00	
26	650	215.00	340.00		268.00			340.00						
28	700	247.00	390.00	462.00	308.00			390.00						
30	750	278.00	448.00	521.00	347.00	630.00		448.00						
32	800	325.00	520.00	609.00	406.00	699.00		520.00						
34	850	362.00	570.00	678.00	452.00	759.00		570.00						
36	900	404.00	649.00	757.00	505.00	820.00		649.00						
38	950				569.00			727.00						
40	1000				627.00			792.00						
42	1050				659.00			836.00						
44	1100				724.00			925.00						
46	1150				780.00			995.00						
48	1200				847.00			1080.00						

CONCENTRIC AND ECCENTRIC REDUCER (ACCORDING TO THE BIGGER END SIZE), BUTT WELDING PIPE FITTINGS

NPS	DN	APPROXIMATE WEIGHT IN KGS												
INCHES	METRIC	SCH 10	SCH 20	SCH 30	STD	SCH 40	SCH 60	XS	SCH 80	SCH 100	SCH 120	SCH 140	SCH 160	XXS
1/2	15				0.06	0.06		0.10	0.10				0.12	0.21
3/4	20				0.09	0.09		0.12	0.12				0.17	0.27
1	25				0.14	0.14		0.17	0.17				0.22	0.34
1 1/4	32				0.20	0.20		0.24	0.24				0.30	0.42
1 1/2	40				0.26	0.26		0.33	0.33				0.60	0.79
2	50				0.41	0.41		0.54	0.54				1.04	1.26
2 1/2	65				0.73	0.73		0.94	0.94				1.65	2.26
3	80				0.98	0.98		1.29	1.29				2.40	3.12
3 1/2	90				1.38	1.38		1.85	1.85					
4	100				1.64	1.64		2.21	2.21		3.02		4.38	5.35
5	125				2.72	2.72		3.78	3.78		6.09		7.41	8.68
6	150				3.93	3.93		5.72	5.72		8.65		10.78	12.64
8	200		4.92	5.43	6.31	6.31	7.95	9.26	9.26	9.53	14.99	15.91	18.43	17.88
10	250		7.89	8.83	10.50	10.50	13.50	14.20	18.10	21.65	25.90	29.27	32.50	29.27
12	300		11.10	13.37	15.20	17.80	24.33	19.80	29.48	35.70	41.73	46.45	53.31	41.73
14	350	19.18	25.56	28.80	28.80	35.55	47.65	37.70	59.74	73.32	84.50	95.37	105.96	
16	400	24.53	30.49	35.20	35.20	48.28	62.52	46.30	79.68	95.87	111.93	130.45	143.06	
18	450	29.04	36.13	49.82	42.70	64.15	84.68	55.80	104.76	127.46	149.63	168.07	189.08	
20	500	42.72	64.50	84.40	64.50	98.74	133.46	84.40	167.52	205.41	237.71	350.00	370.00	
22	550	52.28	71.30	91.70	71.30		158.33	94.00	201.18	242.93	320.00	390.00	475.00	
24	600	55.95	75.80	113.51	75.80	134.79	187.56	99.90	233.39	289.11	394.00	570.00	610.00	
26	650	75.45	123.00		94.00			123.00						
28	700	79.30	132.00	168.00	101.00			132.00						
30	750	83.20	143.00	181.00	109.00	208.00		143.00						
32	800	95.70	150.00	207.00	117.00	237.00		150.00						
34	850	102.56	157.00	194.00	124.00	242.00		157.00						
36	900	113.09	172.00	218.00	132.00			172.00						
38	950				140.00			186.00						
40	1000				147.00			193.00						
42	1050				155.00			209.00						
44	1100				162.00			217.00						
46	1150				198.00			227.00						
48	1200				207.00			268.00						

WEIGHT OF FITTING 管件重量表

CAP, BUTT WELDING PIPE FITTINGS

NPS	DN	APPROXIMATE WEIGHT IN KGS												
INCHES	METRIC	SCH 10	SCH 20	SCH 30	STD	SCH 40	SCH 60	XS	SCH 80	SCH 100	SCH 120	SCH 140	SCH 160	XXS
1/2	15				0.05	0.05		0.07	0.07				0.11	0.15
3/4	20				0.06	0.06		0.09	0.09				0.13	0.17
1	25				0.11	0.11		0.13	0.13				0.15	0.29
1 1/4	32				0.14	0.14		0.19	0.19				0.23	0.39
1 1/2	40				0.20	0.20		0.23	0.23				0.30	0.50
2	50				0.25	0.25		0.33	0.33				0.55	0.68
2 1/2	65				0.39	0.39		0.53	0.53				0.90	1.33
3	80				0.70	0.70		0.92	0.92				1.45	2.18
3 1/2	90				1.00	1.00		1.30	1.30					
4	100				1.17	1.17		1.70	1.70		2.50		2.75	3.80
5	125				2.00	2.00		2.78	2.78		4.00		5.00	6.22
6	150				3.00	3.00		4.50	4.50		6.00		7.50	9.85
8	200		4.50	5.00	5.50	5.50	7.00	8.35	8.35	11.00	12.27	13.85	19.49	16.40
10	250		6.00	8.00	9.15	9.15	13.60	13.60	17.80	21.00	24.74	29.31	32.98	29.31
12	300		10.00	13.00	15.00	19.00	25.50	22.50	29.50	32.50	41.00	46.12	53.77	41.00
14	350	14.00	14.00	16.00	16.00	24.50	32.10	27.00	40.39	50.00	58.91	67.30	75.70	
16	400	18.00	18.00	21.00	21.00	31.50	40.76	31.50	54.20	64.00	75.57	89.16	98.83	
18	450	22.00	22.00	30.00	26.00	42.00	66.00	36.00	72.50	75.00	88.00	93.00	131.00	
20	500	29.00	32.00	42.00	32.00	60.50	77.62	42.00	106.00	122.46	143.56	153.00	179.00	
22	550	35.50	39.00	51.00	39.00	69.60	89.10	51.00	135.00	154.00	182.04	210.00	240.00	
24	600	42.00	46.00	74.50	46.00	96.50	120.00	60.00	163.00	185.66	219.65	250.00	307.00	
26	650	45.50	66.10		51.00			68.00						
28	700	52.60	74.81	93.50	56.00			75.00						
30	750	51.68	82.80	103.50	62.00	128.55		82.80						
32	800	56.60	93.40	116.75	68.00	133.40		93.40						
34	850	60.40	96.91	121.15	72.60	147.30		96.91						
36	900	66.05	107.00	133.75	82.00			109.00						
38	950				92.00			124.70						
40	1000				102.00			129.30						
42	1050				112.00			142.00						
44	1100				122.00			167.80						
46	1150				136.00			186.00						
48	1200				159.00			215.50						

外径尺寸和壁厚 **ANSI B36.10、B36.19**

公称直径		管外径	ANSI B36.10 B36.19																
mm	in	mm	Sch 5s	Sch 10s	Sch 10	Sch 20	Sch 30	Sch 40s	STD	Sch 40	Sch 60	Sch 80s	XS	Sch 80	Sch 100	Sch 120	Sch 140	Sch 160	XXS
6	1/8	10.29	-	1.24	-	-	-	1.73	1.73	1.73	-	2.41	2.41	2.41	-	-	-	-	-
8	1/4	13.72	-	1.65	-	-	-	2.24	2.24	2.24	-	3.02	3.02	3.02	-	-	-	-	-
10	3/8	17.14	-	1.65	-	-	-	2.31	2.31	2.31	-	3.20	3.20	3.20	-	-	-	-	-
15	1/2	21.34	1.65	2.11	-	-	-	2.77	2.77	2.77	-	3.73	3.73	3.73	-	-	-	4.78	7.47
20	3/4	26.67	1.65	2.11	-	-	-	2.87	2.87	2.87	-	3.91	3.91	3.91	-	-	-	5.56	7.82
25	1	33.40	1.65	2.77	-	-	-	3.38	3.38	3.38	-	4.55	4.55	4.55	-	-	-	6.35	9.09
32	1 1/4	42.16	1.65	2.77	-	-	-	3.56	3.56	3.56	-	4.85	4.85	4.85	-	-	-	6.35	9.70
40	1 1/2	48.26	1.65	2.77	-	-	-	3.68	3.68	3.68	-	5.08	5.08	5.08	-	-	-	7.14	10.15
50	2	60.32	1.65	2.77	-	-	-	3.91	3.91	3.91	-	5.54	5.54	5.54	-	-	-	8.74	11.07
65	2 1/2	73.02	2.11	3.05	-	-	-	5.16	5.16	5.16	-	7.01	7.01	7.01	-	-	-	9.53	14.02
80	3	88.90	2.11	3.05	-	-	-	5.49	5.49	5.49	-	7.62	7.62	7.62	-	-	-	11.13	15.24
90	3 1/2	101.60	2.11	3.05	-	-	-	5.74	5.74	5.74	-	8.08	8.08	8.08	-	-	-	-	-
100	4	114.30	2.11	3.05	-	-	-	6.02	6.02	6.02	-	8.56	8.56	8.56	-	11.13	-	13.49	17.12
125	5	141.30	2.77	3.40	-	-	-	6.55	6.55	6.55	-	9.53	9.53	9.53	-	12.70	-	15.88	19.05
150	6	168.28	2.77	3.40	-	-	-	7.11	7.11	7.11	-	10.97	10.97	10.97	-	14.27	-	18.26	21.95
200	8	219.08	2.77	3.76	3.76	6.35	7.04	8.18	8.18	8.18	10.31	12.70	12.70	12.70	15.09	18.26	20.62	23.01	22.23
250	10	273.05	3.40	4.19	4.19	6.35	7.80	9.27	9.27	9.27	12.70	12.70	12.70	15.09	18.26	21.44	25.40	28.58	25.40
300	12	323.85	3.96	4.57	4.57	6.35	8.38	9.53	9.53	10.31	14.27	12.70	12.70	17.48	21.44	25.40	28.58	33.32	25.40
350	14	355.60	3.96	4.78	6.35	7.92	9.53	9.53	9.53	11.13	15.09	12.70	12.70	19.05	23.83	27.79	31.75	35.71	-
400	16	406.40	4.19	4.78	6.35	7.92	9.53	9.53	9.53	12.70	16.66	12.70	12.70	21.44	26.19	30.96	36.53	40.49	-
450	18	457.20	4.19	4.78	6.35	7.92	11.13	9.53	9.53	14.27	19.05	12.70	12.70	23.83	29.36	34.92	39.67	45.24	-
500	20	508.00	4.78	5.54	6.35	9.53	12.70	9.53	9.53	15.09	20.62	12.70	12.70	26.19	32.54	38.10	44.45	50.01	-
550	22	558.8	4.78	5.54	6.35	9.53	12.70	-	9.53	-	22.23	-	12.70	28.58	34.93	41.28	47.63	53.98	-
600	24	609.6	5.54	6.35	6.35	9.53	14.27	9.53	9.53	17.48	24.61	12.70	12.70	30.96	38.89	46.02	52.37	59.54	-
650	26	660.4	-	-	7.92	12.70	-	-	9.53	-	-	-	12.70	-	-	-	-	-	-
700	28	711.2	-	-	7.92	12.70	15.88	-	9.53	-	-	-	12.70	-	-	-	-	-	-
750	30	762.0	6.35	7.92	7.92	12.70	15.88	-	9.53	-	-	-	12.70	-	-	-	-	-	-
800	32	812.0	-	-	7.92	12.70	15.88	-	9.53	17.48	-	-	12.70	-	-	-	-	-	-
850	34	863.6	-	-	7.92	12.70	15.88	-	9.53	17.48	-	-	12.70	-	-	-	-	-	-
900	36	914.4	-	-	7.92	12.70	15.88	-	9.53	19.05	-	-	12.70	-	-	-	-	-	-
950	38	965.2	-	-	-	-	-	-	9.53	-	-	-	12.70	-	-	-	-	-	-
1000	40	1016.0	-	-	-	-	-	-	9.53	-	-	-	12.70	-	-	-	-	-	-
1050	42	1066.8	-	-	-	-	-	-	9.53	-	-	-	12.70	-	-	-	-	-	-
1100	44	1117.6	-	-	-	-	-	-	9.53	-	-	-	12.70	-	-	-	-	-	-
1150	46	1168.4	-	-	-	-	-	-	9.53	-	-	-	12.70	-	-	-	-	-	-
1200	48	1219.2	-	-	-	-	-	-	9.53	-	-	-	12.70	-	-	-	-	-	-
1300	52	1320.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1350	54	1371.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1400	56	1422.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1500	60	1524.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1600	64	1625.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1700	68	1727.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1800	72	1828.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1900	76	1930.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2000	80	2032.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CHEMICAL ANALYSES AND PHYSICAL PROPERTIES

化学成分与机械性能

Carbon and Alloy Steel Pipe, Fittings and Flanges 碳钢, 合金钢的钢管, 管件, 法兰盘

Material	Standard	Grade	Product	Chemical Composition %										Physical Properties			
				C	Mn	P	S	Si	Cr	Mo	Ni	Cu	Others	Tensile min		Yield min	
				(Max)		(Max)	(Max)		(Max)	(Max)	(Max)	(Max)		lb/in ²	MPa	lb/in ²	MPa
Carbon Steel	API 5L PLS2	B	Linepipe	0.24	1.20 max	0.025	0.015	0.40						60200	415	35500	245
		X42	Linepipe	0.24	1.20 max	0.025	0.015	0.40						60200	415	42100	290
		X46	Linepipe	0.24	1.20 max	0.025	0.015	0.40						63100	435	46400	320
		X52	Linepipe	0.24	1.40 max	0.025	0.015	0.45						66700	460	52200	360
		X60	Linepipe	0.24	1.40 max	0.025	0.015	0.45						75400	520	60200	415
		X65	Linepipe	0.18	1.70 max	0.025	0.015	0.45						77600	535	65300	450
		X70	Linepipe	0.18	1.80 max	0.025	0.015	0.45						82700	570	70300	485
Carbon Steel	ASTM A53	B	Pipe	0.30	1.20 max	0.050	0.045		0.40	0.15	0.40	0.40	V 0.08max	60000	415	35000	240
Carbon Steel	ASTM A106	B	Pipe	0.30	0.27-0.93	0.035	0.035	0.10 min	0.40	0.15	0.40	0.40	V 0.08max	60000	415	35000	240
	ASTM A234	WPB	Fittings	0.30	0.29-1.06	0.050	0.058	0.10 min	0.40	0.15	0.40	0.40	V 0.08max	60000	415	35000	240
Carbon Steel	ASTM A106	C	Pipe	0.35	0.27-0.93	0.035	0.035	0.10 min	0.40	0.15	0.40	0.40	V 0.08max	70000	485	40000	275
	ASTM A234	WPC	Fittings	0.35	0.29-1.06	0.050	0.058	0.10 min	0.40	0.15	0.40	0.40	V 0.08max	70000	485	40000	275
Carbon Steel	ASTM A105	N	Flanges	0.35	0.60-1.05	0.035	0.040	0.10-0.35	0.30	0.12	0.40	0.40	V 0.08max	70000	485	36000	250
Carbon Steel	ASTM A333	6	Pipe	0.30	0.29-1.06	0.025	0.025	0.10 min						60000	415	35000	240
	ASTM A420	WPL6	Fittings	0.30	0.50-1.35	0.035	0.040	0.15-0.40	0.30	0.12	0.40	0.40	V 0.08max Cb0.02max	60000	415	35000	240
Carbon Steel	ASTM A350	LF2	Flanges	0.30	0.60-1.35	0.035	0.040	0.15-0.30	0.30	0.12	0.40	0.40	V 0.08max Cb0.02max	70000	485	36000	250
Alloy Steel 3.5% Nickel	ASTM A333	3	Pipe	0.19 max	0.31-0.64	0.025	0.025	0.18-0.37			3.18-3.82			65000	450	35000	240
	ASTM A420	WPL3	Fittings	0.20 max	0.31-0.64	0.050	0.050	0.13-0.37			3.20-3.80			65000	450	35000	240
	ASTM A350	LF3	Flanges	0.20 max	0.90 max	0.035	0.040	0.20-0.35	0.03	0.12	3.25-3.75			70000	485	36000	250
Alloy Steel 1.25% Cr 0.50% Mo	ASTM A335	P11	Pipe	0.05-0.15	0.30-0.60	0.025	0.025	0.50-1.00	1.00-1.50	0.44-0.65				60000	415	30000	205
	ASTM A234	WP11 CL1	Fittings	0.05-0.15	0.30-0.60	0.030	0.030	0.50-1.00	1.00-1.50	0.44-0.65				60000	415	30000	205
	ASTM A234	WP11 CL2	Fittings	0.05-0.15	0.30-0.80	0.040	0.040	0.50-1.00	1.00-1.50	0.44-0.65				60000	415	30000	205
	ASTM A234	WP11 CL3	Fittings	0.05-0.15	0.30-0.80	0.040	0.040	0.50-1.00	1.00-1.50	0.44-0.65				75000	520	45000	310
	ASTM A182	F11 CL1	Flanges	0.05-0.15	0.30-0.60	0.030	0.030	0.50-1.00	1.00-1.50	0.44-0.65				60000	415	30000	205
	ASTM A182	F11 CL2	Flanges	0.10-0.20	0.30-0.80	0.040	0.040	0.50-1.00	1.00-1.50	0.44-0.65				70000	485	40000	275
	ASTM A182	F11 CL3	Flanges	0.10-0.20	0.30-0.80	0.040	0.040	0.50-1.00	1.00-1.50	0.44-0.65				75000	515	45000	310
Alloy Steel 2.25% Cr 1.0% Mo	ASTM A335	P22	Pipe	0.05-0.15	0.30-0.60	0.025	0.025	0.50 max	1.90-2.60	0.87-1.13				60000	415	30000	205
	ASTM A234	WP22 CL1	Fittings	0.05-0.15	0.30-0.60	0.040	0.040	0.50 max	1.90-2.60	0.87-1.13				60000	415	30000	205
	ASTM A234	WP22 CL3	Fittings	0.05-0.15	0.30-0.60	0.040	0.040	0.50 max	1.90-2.60	0.87-1.13				75000	520	45000	310
	ASTM A182	F22 CL1	Flanges	0.05-0.15	0.30-0.60	0.040	0.040	0.50 max	2.00-2.50	0.87-1.13				60000	415	30000	205
	ASTM A182	F22 CL3	Flanges	0.05-0.15	0.30-0.60	0.040	0.040	0.50 max	2.00-2.50	0.87-1.13				75000	515	45000	310
Alloy Steel 4-6% Cr 0.5% Mo	ASTM A335	P5	Pipe	0.15 max	0.30-0.60	0.040	0.030	0.50 max	4.00-6.00	0.45-0.65				60000	415	30000	205
	ASTM A234	WP5	Fittings	0.15 max	0.30-0.60	0.040	0.030	0.50 max	4.00-6.00	0.44-0.65				75000	520	45000	310
	ASTM A182	F5	Flanges	0.15 max	0.30-0.60	0.030	0.030	0.50 max	4.00-6.00	0.44-0.65	0.50			70000	485	40000	275
Alloy Steel 9% Cr	ASTM A335	P9	Pipe	0.15 max	0.30-0.60	0.025	0.025	0.25-1.00	8.00-10.00	0.90-1.10				60000	415	30000	205
	ASTM A234	WP9 CL1	Fittings	0.15 max	0.30-0.60	0.030	0.030	1.00 max	8.00-10.00	0.90-1.10				60000	415	30000	205
	ASTM A234	WP9 CL3	Fittings	0.15 max	0.30-0.60	0.030	0.030	1.00 max	8.00-10.00	0.90-1.10				75000	520	45000	310
	ASTM A182	F9	Flanges	0.15 max	0.30-0.60	0.030	0.030	0.50-1.00	8.00-10.00	0.90-1.10				85000	585	55000	380

AMERICAN PIPE SPECIFICATIONS AND THEIR NEAREST EQUIVALENT STANDARDS - CARBON AND ALLOY

美标钢管标准和与它相关的标准对照表--碳钢，合金钢

American		British (BS)		German (DIN)			Italian (UNI)		French (NFA)		Japanese (JIS)	
Standard	Grade	Standard	Grade	Standard	Grade	Werkstoff	Standard	Grade	Standard	Grade	Standard	Grade
API5L	A			17172	StE 210.7	1.0307			49112	TUE220A		
	B				StE 240.7	1.0457				TUE235B		
	X42				StE 290.7	1.0484						
	X46				StE 320.7	1.0409						
	X52				StE 360.7	1.0582						
	X56				StE 385.7	1.8970						
	X60				StE 415.7	1.8972						
ASTM A53	A	1387 (Medium)		2440	St 33.2	1.0035			49115			
		1387 (Heavy)		2441	St 33.2	1.0035			49145			
ASTM A53	A	3601	320 360	1629	St 37.0	1.0254	6363	Fe360	49112	TUE220A	G3454	STP6370
ASTM A53	B	3601	430	1629	St 44.0	1.0256	6363	Fe410	49112	TUE235A	G3454	STPG410
		6323	HFS-5	1629	St 52.0	1.0421	6363	Fe510	49311	TU52b		
ASTM A106	A	3602 Pt 1	360	17175 Q1	St 35.8	1.0305			49211 49213	TUE220B TU37C	G3456	STPT370
ASTM A106	B	3602 Pt 1	430	17175 Q1	St 45.8	1.0405			49211 49213	TUE250B TU42C	G3456	STPT410
ASTM A333	6	3603	430LT	17179	T StE 285	1.0488			49230	TU42BT	G3460	STPL380
ASTM A333	3	3603	503LT	17173	10Ni14	1.5637	5949	18NM4	49230	TU10N14	G3460	STPL450
ASTM A335	P1			17175 Q3	15Mo3	1.5423	5462	16Mo5	498213	TU15D3	G3458	STPA12
	P12	3604	620-440		13CrMo44	1.7335		14CrMo3		TU10CD404		STPA22
	P11		621							TU10CD505		STPA23
	P22		622		10CrMo910	1.7380		12CrMo910		TU10CD910		STPA24
	P5		625	(Based on	12CrMo195	1.7362				TUZ12CD505		STPA25
	P9		629-470	17175)	X12CrMo91	1.7386				TUZ10CD9		STPA26

AMERICAN PIPE SPECIFICATIONS AND THEIR NEAREST EQUIVALENT STANDARDS - STAINLESS STEEL

美标钢管标准和与它相关的标准对照表--不锈钢

American		British (BS)	German (DIN)	Italian (UNI)	French (NFA)	Japanese (JIS)
Standard	Grade	Grade	Werkstoff	Grade	Grade	Grade
ASTM A312	304	304515	1.4301	X8CN1910	Z6CN18-09	SUS304
ASTM A312	304L	304512	1.4306	X3CN1911	Z2CN18-10	SUS304L
ASTM A312	316	316516	1.4436	X8CND1712	Z6CND17-12	SUS316J1
ASTM A312	316L	316512	1.4435	-	Z2CND17-13	SUS316J1
ASTM A312	321	321512	1.4541	X8CNT1810	Z6CNT18-09	SUS321
ASTM A312	347	347517	1.4550	X8CNNB1811	Z6CNNB18-09	SUS347
ASTM A312	310	310524	1.4845	X8CN2520	Z10CNS25-20	SUS310S
ASTM A312	317L	317512	1.4438	-	-	SUS317L

CHEMICAL COMPOSITION AND MECHANICAL PROPERTIES OF MATERIAL FOR FITTINGS OF WROUGHT STAINLESS STEEL ACCORDING TO ASTM A-403 SPECS

ASTM A403标准的化学成份和机械性能对照表

ASTM Grade	Material	ASTM Spec.		Chemical Composition %									Physical Properties		
		Designation	Grade	C (Max)	Mn (Max)	P (Max)	S (Max)	Si (Max)	Ni	Cr	Mo	Others	Tensile min MPa	Yield min MPa	Elongation Longitudinal
WP316L	Pipe	A312	TP316L	0.035	2.00	0.045	0.03	1.00	10.0-14.0	16.0-18.0	2.0-3.0		485	170	28
	Plate	A240	316L	0.03	2.00	0.045	0.03	0.75	10.-14.0	16.0-18.0	2.0-3.0		485	170	40
	Fittings	A403	316L	0.03	2.00	0.045	0.03	1.00	10.0-14.0	16.0-18.0	2.0-3.0		485	170	28
	Forging	A182	F316L	0.03	2.00	0.045	0.03	1.00	10.0-14.0	16.0-18.0	2.0-3.0		485	170	30
WP321	Pipe	A312	TP321	0.08	2.00	0.045	0.03	1.00	9.0-12.0	17.0-19.0			515	205	28
	Plate	A240	321	0.08	2.00	0.045	0.03	0.75	9.0-12.0	17.0-19.0			515	205	40
	Fittings	A403	321	0.08	2.00	0.045	0.03	1.00	9.0-12.0	17.0-19.0	-		515	205	28
	Forging	A182	F321	0.08	2.00	0.045	0.03	1.00	9.0-12.0	17.0-19.0			515	205	30
WP321H	Pipe	A312	TP321H	0.04-0.1	2.00	0.045	0.03	1.00	9.0-12.0	17.0-19.0			515	205	28
	Plate	A240	321H	0.04-0.1	2.00	0.045	0.03	0.75	9.0-12.0	17.0-19.0			515	205	40
	Fittings	A403	321H	0.04-0.1	2.00	0.045	0.03	1.00	9.0-12.0	17.0-19.0	-		515	205	28
	Forging	A182	F321H	0.04-0.1	2.00	0.045	0.03	1.00	9.0-12.0	17.0-19.0			515	205	30
WP347	Pipe	A312	TP347	0.08	2.00	0.045	0.03	1.00	9.0-13.0	17.0-19.0			515	205	28
	Plate	A240	347	0.08	2.00	0.045	0.03	0.75	9.0-13.0	17.0-19.0			515	205	40
	Fittings	A403	347	0.08	2.00	0.045	0.03	1.00	9.0-12.0	17.0-19.0			515	205	28
	Forging	A182	F347	0.08	2.00	0.045	0.03	1.00	9.0-13.0	17.0-20.0			515	205	30
WP304	Pipe	A312	TP304	0.08	2.00	0.045	0.03	1.00	8.0-11.0	18.0-20.0			515	205	28
	Plate	A240	304	0.08	2.00	0.045	0.03	1.00	8.0-10.5	18.0-20.0			515	205	40
	Fittings	A403	304	0.08	2.00	0.045	0.03	1.00	8.0-11.0	18.0-20.0			515	205	28
	Forging	A182	F304	0.08	2.00	0.045	0.03	1.00	8.0-11.0	18.0-20.0			515	205	30
WP304L	Pipe	A312	TP316L	0.035	2.00	0.045	0.03	1.00	8.0-13.0	18.0-20.0			485	170	28
	Plate	A240	304L	0.03	2.00	0.045	0.03	0.75	8.0-12.0	18.0-20.0			485	170	40
	Fittings	A403	304L	0.03	2.00	0.045	0.03	1.00	8.0-11.0	18.0-20.0			485	170	28
	Forging	A182	F304L	0.03	2.00	0.045	0.03	1.00	8.0-13.0	18.0-20.0			485	170	30
WP309	Pipe	A312	TP309	0.08	2.00	0.045	0.03	1.00	12.0-15.0	22.-24.0	0.75		515	205	28
	Plate	A240	309	0.2	2.00	0.045	0.03	0.75	12.0-15.0	22.-24.0			515	205	40
	Fittings	A403	309	0.2	2.00	0.045	0.03	1.00	12.0-15.0	22.-24.0			515	205	28
	Forging	A182	F309	0.04-0.1	2.00	0.045	0.03	1.00	12.0-15.0	22.-24.0			515	205	30
WP310S	Pipe	A312	TP310	0.08	2.00	0.045	0.03	1.00	19.0-22.0	24.0-26.0	0.75		515	205	28
	Plate	A240	310	0.08	2.00	0.045	0.03	1.50	19.0-22.0	24.0-26.0			515	205	40
	Fittings	A403	310	0.08	2.00	0.045	0.03	1.00	19.0-22.0	24.0-26.0			515	205	28
	Forging	A182	F310	0.04-0.1	2.00	0.045	0.03	1.00	19.0-22.0	24.0-26.0			515	205	30
WP316	Pipe	A312	TP316	0.08	2.00	0.045	0.03	1.00	11.0-14.0	16.0-18.0	2.0-3.0		515	205	28
	Plate	A240	316	0.08	2.00	0.045	0.03	0.75	10.0-14.0	16.0-18.0	2.0-3.0		515	205	40
	Fittings	A403	316	0.08	2.00	0.045	0.03	1.00	10.0-14.0	16.0-18.0	2.0-3.0		515	205	28
	Forging	A182	F316	0.08	2.00	0.045	0.03	1.00	10.0-14.0	16.0-18.0	2.0-3.0		515	205	30
WP316H	Pipe	A312	TP316H	0.04-0.1	2.00	0.045	0.03	1.00	11.0-14.0	16.0-18.0	2.0-3.0		515	205	28
	Plate	A240	316H	0.04-0.1	2.00	0.045	0.03	0.75	10.0-14.0	16.0-18.0	2.0-3.0		515	250	40
	Fittings	A403	316H	0.04-0.1	2.00	0.045	0.03	1.00	10.0-14.0	16.0-18.0	2.0-3.0		515	205	28
	Forging	A182	F316H	0.04-0.1	2.00	0.045	0.03	1.00	10.0-14.0	16.0-18.0	2.0-3.0		515	205	30

Hot Induction Bend

APCO's hot induction bends are manufactured in compliance with following applicable standards and non-standard as required by customers.

ASME B16.49-2007 ASME B16.25-2007

MSSSP-75-2008 ASME B31.1-1998, ASME B31.8-2007

Nominal Pipe Size in.	Outside Diameter O.D.(mm)	BENDING RADIUS (mm)						Angle Bending θ	Tangent length at each end	Wall Thickness (mm)
		3D	4D	5D	6D	8D	10D			
3"	89	267	356	445	534	712	890	90°, 60°, 45°,30°, 22.5°, or as per the choice of purchaser	350	Sch STD, Sch 10, Sch 20, Sch 30, Sch 40, Sch 80, etc. or as per the choice of purchaser
4"	114	342	456	570	684	912	1140		350	
6"	168	504	672	840	1008	1344	1680		350	
8"	219	657	876	1095	1314	1752	2190		700	
10"	273	819	1092	1365	1638	2184	2730		700	
12"	325	975	1300	1625	1950	2600	3250		700	
14"	356	1068	1424	1780	2136	2848	3560		700	
16"	406	1218	1624	2030	2436	3248	4060		700	
18"	457	1371	1828	2285	2742	3656	4570		1000	
20"	508	1524	2032	2540	3048	4064	5080		1000	
22"	559	1677	2236	2795	3354	4472	5590		1000	
24"	610	1830	2440	3050	3660	4880	6100		1000	
26"	660	1980	2640	3300	3960	5280	6600		1 D (Outside diameter of bend) or as per the choice of purchaser	
28"	711	2133	2844	3555	4266	5688	7110			
30"	762	2286	3048	3810	4572	6096	7620			
32"	813	2439	3252	4065	4878	6504	8130			
34"	864	2592	3456	4320	5184	6912	8640			
36"	914	2742	3656	4570	5484	7312	9140			
38"	965	2895	3860	4825	5790	7720	9650			
40"	1016	3048	4064	5080	6096	8128	10160			
42"	1067	3201	4268	5335	6402	8536	10670			
44"	1118	3354	4472	5590	6708	8944	11180			
46"	1168	3504	4672	5840	7008	9344	11680			
48"	1219	3657	4876	6095	7314	9752	12190			
50"	1270	3810	5080	6350	7620	10160	12700			
52"	1321	3963	5284	6605	7926	10568	13210			
54"	1372	4116	5488	6860	8232	10976	13720			
56"	1422	4266	5688	7110	8532	11376	14220			

Bend end preparation: Welding ends to be beveled as per ASME B16.25 or as per specified by purchaser

Induction Pipe Bending Standard Bend Tolerances

Bend Angle: $\pm 1/2^\circ$

Bend Radius: $\pm 1\%$

Bend Plane: $\pm 1^\circ$

End squareness

Size NPS 36" and smaller: 2.4 mm (0.09")

Size Greater than NPS 36": 3.0 mm (0.12")

Linear Dimensions

Size NPS 24" and smaller: ± 5 mm (0.19")

Size Greater than NPS 24": ± 6 mm (0.25")

Wall Thickness: $< 0.10\%$ of the bend nominal wall thickness

Ovality within bend: $\leq 3\%$ of the nominal mating pipe outside diameter.

Ovality at the welding Ends: $\leq 1\%$ of the nominal mating pipe outside diameter.

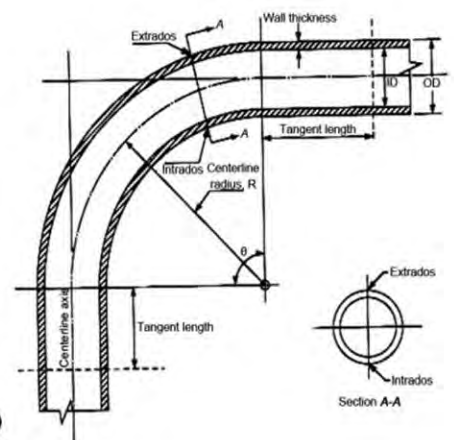
Outside diameter at each welding end: $\pm 1\%$ of the mating pipe outside diameter

Inside diameter at each welding end: Size NPS 36" and smaller: ± 2.5 mm (0.10")

Size larger than NPS 36": ± 3.0 mm (0.12")

Inside diameter at any location in the bend: $> 97\%$ of the minimum specified matching pipe internal diameter.

Closer tolerance than those given above are available when required.





CSA Z245.11

BUTTWELD PIPE FITTINGS

MANUFACTURED BY

APCO PIPE FITTINGS CO., LTD.

ALSO OPERATING AS

MANFRED GELDBACH (YINGKOU) FLANGE & FITTINGS CO. LTD

CANADIAN STANDARD - CSA Z245.11

DISCLAIMER

THE DATA CONTAINED IN THIS CATALOGUE IS INTENDED FOR SALES ASSISTANCE, TO SHOW THE RANGE OF BUTTWELD PIPE FITTINGS MANUFACTURED BY APCO PIPE FITTINGS CO., LTD. (ALSO KNOWN AS MANFRED GELDBACH (YINGKOU) FLANGE & FITTINGS CO., LTD.)

ALTHOUGH CARE HAS BEEN TAKEN TO INSURE THAT THE DATA CONTAINED HEREIN IS ACCURATE, IT IS NOT INTENDED FOR USE TO MANUFACTURE OR INSPECT BUTTWELD FITTINGS TO CSA Z245.11.

PLEASE REFER TO CSA Z245.11 FOR DETAILS BEFORE INSPECTING OR MANUFACTURING ANY BUTTWELD PIPE FITTINGS



CSA Z245.11

SIZE, GRADE AND CATEGORY

COMPARING TO ASTM - ASME BUTTWELD PIPE FITTINGS to CSA Z245.11

Unlike other standards such as ASTM A234 WPB and ASME B16.9, there is only one standard covering the material and the dimensions. The dimension in CSA Z245.11 remain the same for all grades, but the tolerance are specific to certain grades

SIZE Apco Pipe Fittings Co., Ltd. manufactures CSA Z245.11 fittings in sizes from NPS 1/2" to 48"

GRADE Apco Pipe Fittings Co., Ltd. manufactures CSA Z245.11 fittings in grades 207 to 483

CATEGORY Apco Pipe Fittings Co. Ltd manufactures CSA Z245.11 fittings in two categorys

Category I - also known as CAT I - for fittings without proven notch toughness properties - charpy

Category II - also known as CAT II - for fittings requiring proven notch toughness properties - charpy

UNIT OF MEASUREMENT: All measurements in the CSA section are in mm (METRIC)

DISCLAIMER

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CSA Z245.11

SPECIAL ATTENTION TO CSA Z245.11 REQUIREMENTS

THE ITEMS MENTIONED BELOW ARE NOT ALL COVERED IN THIS CATALOGUE - FOR MANUFACTURE OR INSPECTION, PLEASE REFER TO CSA Z245.11. SEE GUIDE BELOW.

	DETAILS REQUIRED	LOCATION
A	Markings	Section 14
B	Certification	Section 15
C	Tensiles	Table 1
D	Chemical	Table 6
E	Charpy test specimen	Table 8
F	Bend pipe tolerance	Table 14
G	Location of sample and frequency - bend tests	Table 7
H	Guided Bend Tests	Figure 1 & 2
I	Weld end preparation	Figure 3 & 4
J	Dimensions	Tables 2, 3, 9 - 13

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CSA Z245.11

CHEMICAL COMPOSITION - MAXIMUM LIMITED BY GRADE

	GRADE 214 & LOWER MAX. BY PERCENTAGE	GRADE 290 & HIGHER MAX. BY PERCENTAGE
Carbon	0.35	0.30
Manganese	1.35	1.60
Phosphorus	0.05	0.05
Sulphur	0.06	0.06
Silicon	0.35	0.50
Copper		1.50
Nickle		1.00
Chromium		0.25
Molybdenum		0.25
Vanadium		0.13
Niobium/Columbium		0.10
Boron		0.001

MAXIMUM CARBON EQUIVALENT

CARBON EQUIVALENT SHALL BE CALCULATED USING THE FORMULA BELOW

$$C. E. = C + F (Mn/6 + Si/24 + Cu/15 + Ni/20 + (Cr + Mo + V + Nb)/5 + 5B)$$

WHERE F = A COMPLIANCE FACTOR THAT IS DEPENDENT ON CARBON CONTENT AS SPECIFIED BELOW

CARBON CONTENT IN %	F	CARBON CONTENT IN %	F	CARBON CONTENT IN %	F
<0.06	0.53	0.11	0.70	0.17	0.94
0.06	0.54	0.12	0.75	0.18	0.96
0.07	0.56	0.13	0.8	0.19	0.97
0.08	0.58	0.14	0.85	0.2	0.98
0.09	0.62	0.15	0.88	0.21	0.99
0.10	0.66	0.16	0.92	>0.21	1

THIS DATA IS INTENDED FOR REFERENCE ONLY, TO SHOW THE FITTINGS MANUFACTURED BY APCO PIPE FITTINGS CO. LTD. ALTHOUGH CARE HAS BEEN TAKEN TO INSURE THAT THE DATA IS CORRECT, IT IS NOT INTENDED FOR USE TO MANUFACTURE OR INSPECT PIPE FITTINGS MANUFACTURED TO CSA Z245.11 . PLEASE REFER TO CSA Z245.11 FOR COMPLETE DETAILS



CSA Z245.11

TENSILE REQUIREMENTS

Grade	Minimum yield strength, MPa	Minimum tensile strength, MPa	Minimum elongation in 50 mm, %
207	207	331	20%
241	241	414	20%
290	290	414	20%
317	317	434	20%
359	359	455	20%
386	386	490	20%
414	414	517	20%
448	448	531	18%
483	483	565	16%
550	550	620	16%
620	620	690	16%
690	690	760	16%

DISCLAIMER

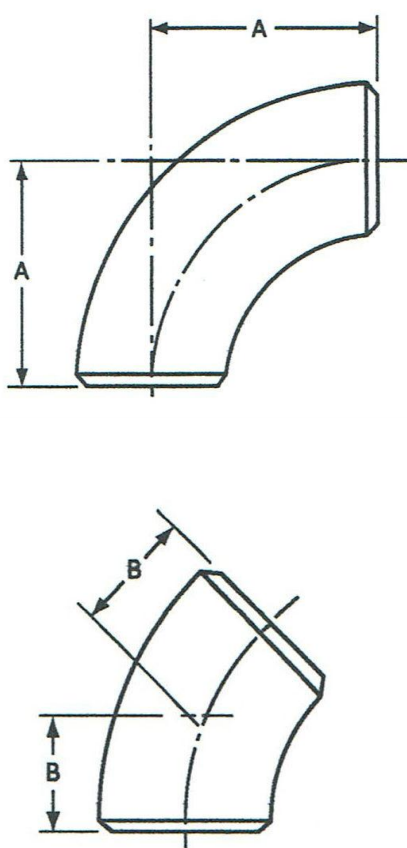
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PLEASE REFER TO CSA Z245.11 FOR DETAILS BEFORE INSPECTING OR MANUFACTURING ANY BUTTWELD PIPE FITTINGS

CSA Z245.11

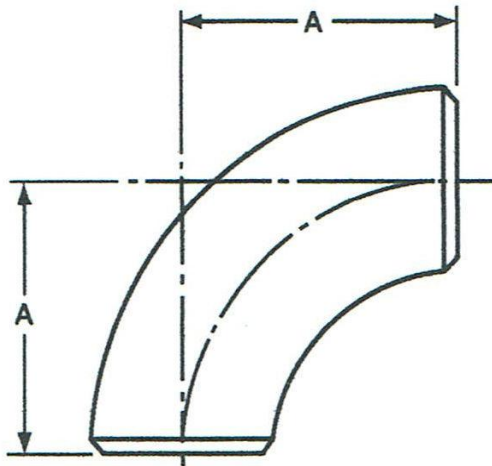
LONG RADIUS ELBOWS 90 AND 45 DEGREE



Size	outside diameter at bevel	Centre-to-end dimension	
		90 elbows A	45
NPS 1/2	21.3	38	16
NPS 3/4	26.7	38*	19*
NPS 1	33.4	38	22
NPS 1-1/4	42.2	48	25
NPS 1-1/2	48.3	57	29
NPS 2	60.3	76	35
NPS 2-1/2	73.0	95	44
NPS 3	88.9	114	51
NPS 3-1/2	101.6	133	57
NPS 4	114.3	152	64
NPS 5	141.3	190	79
NPS 6	168.3	229	95
NPS 8	219.1	305	127
NPS 10	273.1	381	159
NPS 12	323.9	457	190
NPS 14	355.6	533	222
NPS 16	406.4	610	254
NPS 18	457	686	286
NPS 20	508	762	318
NPS 22	559	838	343
NPS 24	610	914	381
NPS 26	660	991	406
NPS 28	711	1067	438
NPS 30	762	1143	470
NPS 32	813	1219	502
NPS 34	864	1295	533
NPS 36	914	1372	565
NPS 38	965	1448	600
NPS 40	1016	1524	632
NPS 42	1067	1600	660
NPS 44	1118	1676	695
NPS 46	1168	1753	727
NPS 48	1219	1829	759

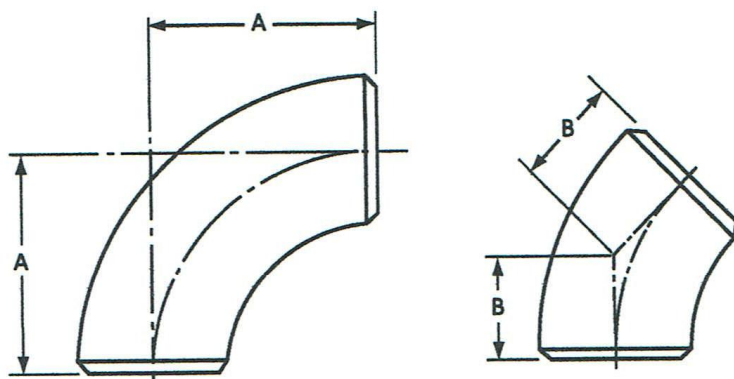
CSA Z245.11

Short Radius 90 Elbow



Size	O.D. at bevel	Centre-to-end
		A
NPS 1	33.4	25
NPS 1-1/4	42.2	32
NPS 1-1/2	48.3	38
NPS 2	60.3	51
NPS 2-1/2	73.0	64
NPS 3	88.9	76
NPS 3-1/2	101.6	89
NPS 4	114.3	102
NPS 5	141.3	127
NPS 6	168.3	152
NPS 8	219.1	203
NPS 10	273.1	254
NPS 12	323.9	305
NPS 14	355.6	356
NPS 16	406.4	406
NPS 18	457	457
NPS 20	508	508
NPS 22	559	559
NPS 24	610	610

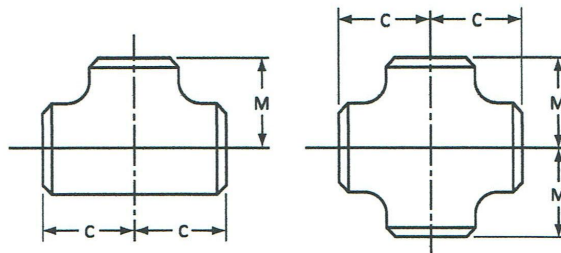
3 R ELBOWS



Size	Nominal outside diameter at bevel, mm	90° elbows, A	60° elbows, B	45° elbows, B	30° elbows, B
NPS 16	406.4	1219	703	505	327
NPS 18	457	1372	789	568	367
NPS 20	508	1524	879	632	408
NPS 22	559	1676	968	694	449
NPS 24	610	1829	1057	757	490
NPS 26	660	1981	1143	821	519
NPS 30	762	2286	1321	946	611
NPS 34	864	2591	1497	1073	695
NPS 36	914	2743	1586	1137	735
NPS 38	965	2896	1673	1200	776
NPS 40	1016	3048	1759	1264	818
NPS 42	1067	3200	1848	1326	857
NPS 44	1118	3353	1937	1389	899
NPS 46	1168	3505	2024	1453	940
NPS 48	1219	3658	2113	1516	981

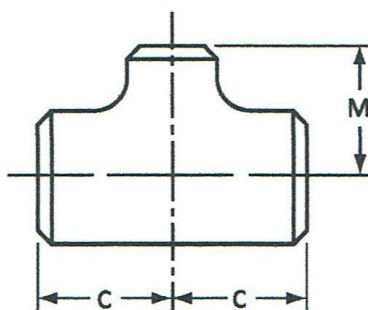
CSA Z245.11

EQUAL TEE



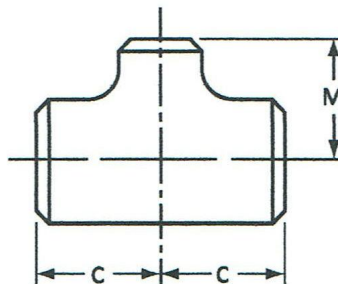
Size	Outside diameter at bevel	Centre-to-end dimension	TEE	CROSS
		Run	Outlet	Outlet
		C	M	M
NPS 1/2	21.3	25	25	25
NPS 3/4	26.7	29	29	29
NPS 1	33.4	38	38	38
NPS 1 1/4	42.2	48	48	48
NPS 1 1/2	48.3	57	57	57
NPS 2	60.3	64	64	64
NPS 2 1/2	73.0	76	76	76
NPS 3	88.9	86	86	86
NPS 3 1/2	101.6	95	95	95
NPS 4	114.3	105	105	105
NPS 5	141.3	124	124	124
NPS 6	168.3	143	143	143
NPS 8	219.1	178	178	178
NPS 10	273.1	216	216	216
NPS 12	323.9	254	254	254
NPS 14	355.6	279	279	279
NPS 16	406.4	305	305	305
NPS 18	457	343	343	343
NPS 20	508	381	381	381
NPS 22	559	419	419	419
NPS 24	610	432	432	432
NPS 26	660	495	495	—
NPS 28	711	521	521	—
NPS 30	762	559	559	—
NPS 32	813	597	597	—
NPS 34	864	635	635	—
NPS 36	914	673	673	—
NPS 38	965	711	711	—
NPS 40	1016	749	749	—
NPS 42	1067	762	711	—
NPS 44	1118	813	762	—
NPS 46	1168	851	800	—
NPS 48	1219	889	838	—

REDUCING TEES



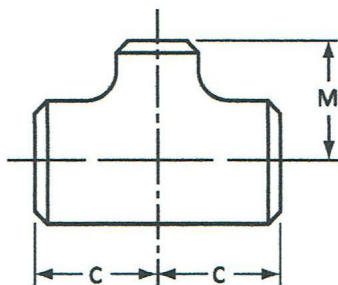
Size	Nominal outside diameter at bevel		Run, C	Centre-to-end dimension Outlet, M
	Run	Outlet		
NPS 1/2 x 1/2 x 3/8	21.3	17.1	25	25
NPS 1/2 x 1/2 x 1/4	21.3	13.7	25	25
NPS 3/4 x 3/4 x 1/2	26.7	21.3	29	29
NPS 3/4 x 3/4 x 3/8	26.7	17.1	29	29
NPS 1 x 1 x 3/4	33.4	26.7	38	38
NPS 1 x 1 x 1/2	33.4	21.3	38	38
NPS 1-1/4 x 1-1/4 x 1	42.2	33.4	48	48
NPS 1-1/4 x 1-1/4 x 3/4	42.2	26.7	48	48
NPS 1-1/4 x 1-1/4 x 1/2	42.2	21.3	48	48
NPS 1-1/2 x 1-1/2 x 1-1/4	48.3	42.2	57	57
NPS 1-1/2 x 1-1/2 x 1	48.3	33.4	57	57
NPS 1-1/2 x 1-1/2 x 3/4	48.3	26.7	57	57
NPS 1-1/2 x 1-1/2 x 1/2	48.3	21.3	57	57
NPS 2 x 2 x 1-1/2	60.3	48.3	64	60
NPS 2 x 2 x 1-1/4	60.3	42.2	64	57
NPS 2 x 2 x 1	60.3	33.4	64	51
NPS 2 x 2 x 3/4	60.3	26.7	64	44
NPS 2-1/2 x 2-1/2 x 2	73.0	60.3	76	70
NPS 2-1/2 x 2-1/2 x 1-1/2	73.0	48.3	76	67
NPS 2-1/2 x 2-1/2 x 1-1/4	73.0	42.2	76	64
NPS 2-1/2 x 2-1/2 x 1	73.0	33.4	76	57
NPS 3 x 3 x 2-1/2	88.9	73.0	86	83
NPS 3 x 3 x 2	88.9	60.3	86	76

REDUCING TEES



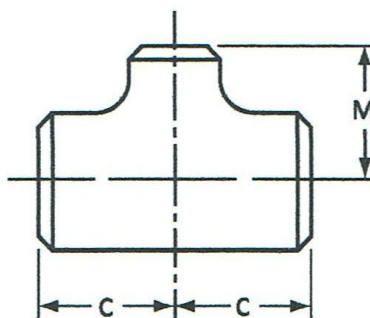
Size	Nominal outside diameter at bevel		Run, C	Centre-to-end dimension Outlet, M
	Run	Outlet		
NPS 3 x 3 x 1-1/2	88.9	48.3	86	73
NPS 3 x 3 x 1-1/4	88.9	42.2	86	70
NPS 3-1/2 x 3-1/2 x 3	101.6	88.9	95	92
NPS 3-1/2 x 3-1/2 x 2-1/2	101.6	73.0	95	89
NPS 3-1/2 x 3-1/2 x 2	101.6	60.3	95	83
NPS 3-1/2 x 3-1/2 x 1-1/2	101.6	48.3	95	79
NPS 4 x 4 x 3-1/2	114.3	101.6	105	102
NPS 4 x 4 x 3	114.3	88.9	105	98
NPS 4 x 4 x 2-1/2	114.3	73.0	105	95
NPS 4 x 4 x 2	114.3	60.3	105	89
NPS 4 x 4 x 1-1/2	114.3	48.3	105	86
NPS 5 x 5 x 4	141.3	114.3	124	117
NPS 5 x 5 x 3-1/2	141.3	101.6	124	114
NPS 5 x 5 x 3	141.3	88.9	124	111
NPS 5 x 5 x 2-1/2	141.3	73.0	124	108
NPS 5 x 5 x 2	141.3	60.3	124	105
NPS 6 x 6 x 5	168.3	141.3	143	137
NPS 6 x 6 x 4	168.3	114.3	143	130
NPS 6 x 6 x 3-1/2	168.3	101.6	143	127
NPS 6 x 6 x 3	168.3	88.9	143	124
NPS 6 x 6 x 2-1/2	168.3	73.0	143	121
NPS 8 x 8 x 6	219.1	168.3	178	168
NPS 8 x 8 x 5	219.1	141.3	178	162
NPS 8 x 8 x 4	219.1	114.3	178	156

REDUCING TEES



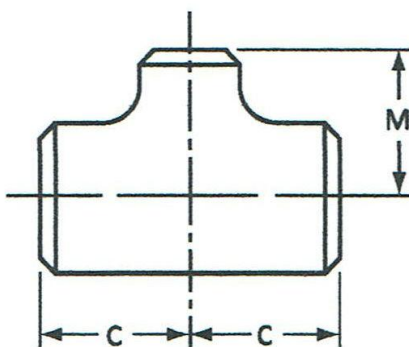
Size	Nominal outside diameter at bevel		Run, C	Centre-to-end dimension Outlet, M
	Run	Outlet		
NPS 8 x 8 x 3-1/2	219.1	101.6	178	152
NPS 10 x 10 x 8	273.1	219.1	216	203
NPS 10 x 10 x 6	273.1	168.3	216	194
NPS 10 x 10 x 5	273.1	141.3	216	191
NPS 10 x 10 x 4	273.1	114.3	216	184
NPS 12 x 12 x 10	323.9	273.1	254	241
NPS 12 x 12 x 8	323.9	219.1	254	229
NPS 12 x 12 x 6	323.9	168.3	254	219
NPS 12 x 12 x 5	323.9	141.3	254	216
NPS 14 x 14 x 12	355.6	323.9	279	270
NPS 14 x 14 x 10	355.6	273.1	279	257
NPS 14 x 14 x 8	355.6	219.1	279	248
NPS 14 x 14 x 6	355.6	168.3	279	238
NPS 16 x 16 x 14	406.4	355.8	305	305
NPS 16 x 16 x 12	406.4	323.9	305	295
NPS 16 x 16 x 10	406.4	273.1	305	283
NPS 16 x 16 x 8	406.4	219.1	305	273
NPS 16 x 16 x 6	406.4	168.3	305	264
NPS 18 x 18 x 16	457	406.4	343	330
NPS 18 x 18 x 14	457	355.6	343	330
NPS 18 x 18 x 12	457	323.9	343	321
NPS 18 x 18 x 10	457	273.1	343	308
NPS 18 x 18 x 8	457	219.1	343	298
NPS 20 x 20 x 18	508	457	381	368
NPS 20 x 20 x 16	508	406.4	381	356
NPS 20 x 20 x 14	508	355.6	381	356
NPS 20 x 20 x 12	508	323.9	381	346
NPS 20 x 20 x 10	508	273.1	381	333

REDUCING TEES



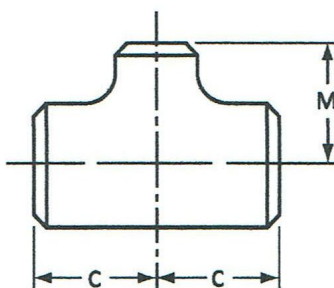
Size	Nominal outside diameter at bevel		Centre-to-end dimension	
	Run	Outlet	Run, C	Outlet, M
NPS 20 x 20 x 8	508	219.1	381	324
NPS 22 x 22 x 20	559	508	419	406
NPS 22 x 22 x 18	559	457	419	394
NPS 22 x 22 x 16	559	406.4	419	381
NPS 22 x 22 x 14	559	355.6	419	381
NPS 22 x 22 x 12	559	323.9	419	371
NPS 22 x 22 x 10	559	273.1	419	359
NPS 24 x 24 x 22	610	559	432	432
NPS 24 x 24 x 20	610	508	432	432
NPS 24 x 24 x 18	610	457	432	419
NPS 24 x 24 x 16	610	406.4	432	406
NPS 24 x 24 x 14	610	355.6	432	406
NPS 24 x 24 x 12	610	323.9	432	397
NPS 24 x 24 x 10	610	273.1	432	384
NPS 26 x 26 x 24	660	610	495	483
NPS 26 x 26 x 22	660	559	495	470
NPS 26 x 26 x 20	660	508	495	457
NPS 26 x 26 x 18	660	457	495	444
NPS 26 x 26 x 16	660	406.4	495	432
NPS 26 x 26 x 14	660	355.6	495	432
NPS 26 x 26 x 12	660	323.9	495	422
NPS 28 x 28 x 26	711	660	521	521
NPS 28 x 28 x 24	711	610	521	508

REDUCING TEES



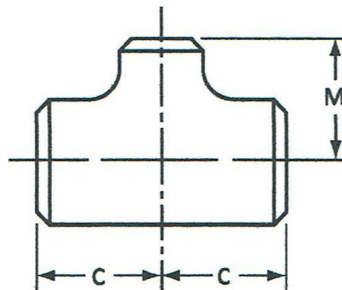
Size	Nominal outside diameter at bevel		Run, C	Centre-to-end dimension
	Run	Outlet		Outlet, M
NPS 28 x 28 x 22	711	559	521	495
NPS 28 x 28 x 20	711	508	521	483
NPS 28 x 28 x 18	711	457	521	470
NPS 28 x 28 x 16	711	406.4	521	457
NPS 28 x 28 x 14	711	355.6	521	457
NPS 28 x 28 x 12	711	323.9	521	448
NPS 30 x 30 x 28	762	711	559	546
NPS 30 x 30 x 26	762	660	559	546
NPS 30 x 30 x 24	762	610	559	533
NPS 30 x 30 x 22	762	559	559	521
NPS 30 x 30 x 20	762	508	559	508
NPS 30 x 30 x 18	762	457	559	495
NPS 30 x 30 x 16	762	406.4	559	483
NPS 30 x 30 x 14	762	355.6	559	483
NPS 30 x 30 x 12	762	323.9	559	473
NPS 30 x 30 x 10	762	273.1	559	460
NPS 32 x 32 x 30	813	762	597	584
NPS 32 x 32 x 28	813	711	597	572
NPS 32 x 32 x 26	813	660	597	572
NPS 32 x 32 x 24	813	610	597	559
NPS 32 x 32 x 22	813	559	597	546
NPS 32 x 32 x 20	813	508	597	533

REDUCING TEES



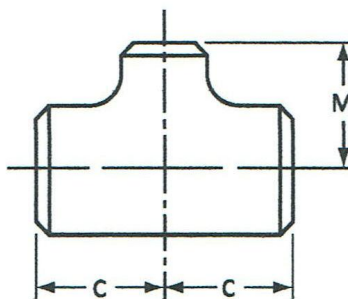
Size	Nominal outside diameter at bevel		Run, C	Centre-to-end dimension Outlet, M
	Run	Outlet		
NPS 32 x 32 x 18	813	457	597	521
NPS 32 x 32 x 16	813	406.4	597	508
NPS 32 x 32 x 14	813	355.6	597	508
NP5 34 x 34 x 32	864	813	635	622
NPS 34 x 34 x 30	864	762	635	610
NPS 34 x 34 x 28	864	711	635	597
NPS 34 x 34 x 26	864	660	635	597
NPS 34 x 34 x 24	864	610	635	584
NPS 34 x 34 x 22	864	559	635	572
NPS 34 x 34 x 20	864	508	635	559
NP5 34 x 34 x 18	864	457	635	546
NPS 34 x 34 x 16	864	406.4	635	533
NP5 36 x 36 x 34	914	864	673	660
NPS 36 x 36 x 32	914	813	673	648
NPS 36 x 36 x 30	914	762	673	635
NPS36 x 36 x 28	914	711	673	622
NPS 36 x 36 x 26	914	660	673	622
NPS 36 x 36 x 24	914	610	673	610
NPS 36 x 36 x 22	914	559	673	597
NPS 36 x 36 x 20	914	508	673	584
NPS 36 x 36 x 18	914	457	673	572
NPS 36 x 36 x 16	914	406.4	673	559
NPS 38 x 38 x 36	965	914	711	711
NPS 38 x 38 x 34	965	864	711	698
NPS 38 x 38 x 32	965	813	711	686

REDUCING TEES



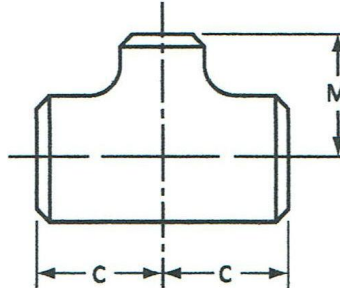
Size	Nominal outside diameter at bevel		Run, C	Centre-to-end dimension Outlet, M
	Run	Outlet		
NPS 38 x 38 x 30	965	762	711	673
NPS 38 x 38 x 28	965	711	711	648
NPS 38 x 38 x 26	965	660	711	648
NPS 38 x 38 x 24	965	610	711	635
NPS 38 x 38 x 22	965	559	711	622
NPS 38 x 38 x 20	965	508	711	610
NPS 38 x 38 x 18	965	457	711	597
NPS 40 x 40 x 38	1016	965	749	749
NPS 40 x 40 x 36	1016	914	749	737
NPS 40 x 40 x 34	1016	864	749	724
NPS 40 x 40 x 32	1016	813	749	711
NPS 40 x 40 x 30	1016	762	749	698
NPS 40 x 40 x 28	1016	711	749	673
NPS 40 x 40 x 26	1016	660	749	673
NPS 40 x 40 x 24	1016	610	749	660
NPS 40 x 40 x 22	1016	559	749	648
NPS 40 x 40 x 20	1016	508	749	635
NPS 40 x 40 x 18	1016	457	749	622
NPS 42 x 42 x 40	1067	1016	762	711
NPS 42 x 42 x 38	1067	965	762	711
NPS 42 x 42 x 36	1067	914	762	711
NPS 42 x 42 x 34	1067	864	762	711

REDUCING TEES



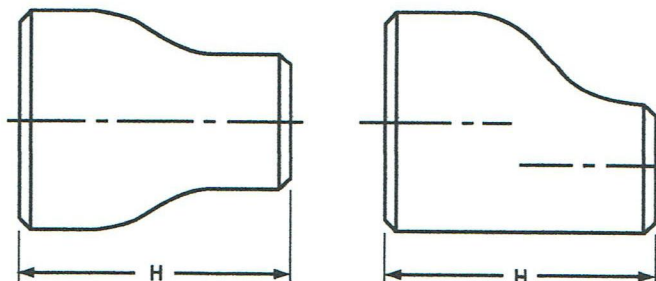
Size	Nominal outside diameter at bevel		Run, C	Centre-to-end dimension
	Run	Outlet		Outlet, M
NPS 42 x 42 x 32	1067	813	762	711
NPS 42 x 42 x 30	1067	762	762	711
NPS 42 x 42 x 28	1067	711	762	698
NPS 42 x 42 x 26	1067	660	762	698
NPS 42 x 42 x 24	1067	610	762	660
NPS 42 x 42 x 22	1067	559	762	660
NPS 42 x 42 x 20	1067	508	762	660
NPS 42 x 42 x 18	1067	457	762	648
NPS 42 x 42 x 16	1067	406.4	762	635
NPS 44 x 44 x 42	1118	1067	813	762
NPS 44 x 44 x 40	1118	1016	813	749
NPS 44 x 44 x 38	1118	965	813	737
NPS 44 x 44 x 36	1118	914	813	724
NPS 44 x 44 x 34	1118	864	813	724
NPS 44 x 44 x 32	1118	813	813	711
NPS 44 x 44 x 30	1118	762	813	711
NPS 44 x 44 x 28	1118	711	813	698
NPS 44 x 44 x 26	1118	660	813	698
NPS 44 x 44 x 24	1118	610	813	698
NPS 44 x 44 x 22	1118	559	813	686
NPS 44 x 44 x 20	1118	508	813	686
NPS 46 x 46 x 44	1168	1118	851	800

REDUCING TEES



Size	Nominal outside diameter at bevel		Run, C	Centre-to-end dimension Outlet, M
	Run	Outlet		
NPS 46 x 46 x 42	1168	1067	851	787
NPS 46 x 46 x 40	1168	1016	851	775
NPS 46 x 46 x 38	1168	965	851	762
NPS 46 x 46 x 36	1168	914	851	762
NPS 46 x 46 x 34	1168	864	851	749
NPS 46 x 46 x 32	1168	813	851	749
NPS 46 x 46 x 30	1168	762	851	737
NPS 46 x 46 x 28	1168	711	851	737
NPS 46 x 46 x 26	1168	660	851	737
NPS 46 x 46 x 24	1168	610	851	724
NPS 46 x 46 x 22	1168	559	851	724
NSP 48 x 48 x 46	1219	1168	889	838
NSP 48 x 48 x 44	1219	1118	889	838
NSP 48 x 48 x 42	1219	1067	889	813
NSP 48 x 48 x 40	1219	1016	889	813
NSP 48 x 48 x 38	1219	965	889	813
NSP 48 x 48 x 36	1219	914	889	787
NSP 48 x 48 x 34	1219	864	889	787
NSP 48 x 48 x 32	1219	813	889	787
NSP 48 x 48 x 30	1219	762	889	762
NSP 48 x 48 x 28	1219	711	889	762
NSP 48 x 48 x 26	1219	660	889	762
NSP 48 x 48 x 24	1219	610	889	737
NSP 48 x 48 x 22	1219	559	889	737

ECCENTRIC AND CONCENTRIC REDUCERS



ALL DIMENSIONS ARE IN MM

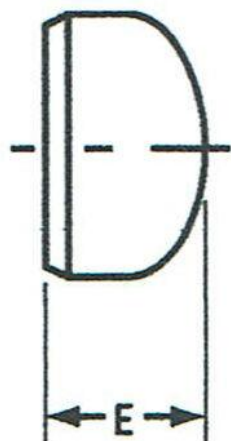
Size	Large end	Small end	End-to-end length H in MM
NPS 3/4 x 1/2	26.7	21.3	38.0
NPS 3/4 x 3/8	26.7	17.1	38.0
NPS 1 x 3/4	33.4	26.7	51.0
NPS 1 x 1/2	33.4	21.3	51.0
NPS 1-1/4 x 1	42.2	33.4	51.0
NPS 1-1/4 x 3/4	42.2	26.7	51.0
NPS 1-1/4 x 1/2	42.2	21.3	51.0
M'S 1-1/2 x 1-1/4	48.3	42.2	64.0
NPS 1-1/2 x 1	48.3	33.4	64.0
NPS 1-1/2 x 3/4	48.3	26.7	64.0
NPS 1-1/2 x 1/2	48.3	21.3	64.0
NPS 2 x 1-1/2	60.3	48.3	76.0
NPS 2 x 1-1/4	60.3	42.2	76.0
NPS 2 x 1	60.3	33.4	76.0
NPS 2 x 3/4	60.3	26.7	76.0
NPS 2-1/2 x 2	73.0	60.3	89.0
NPS 2-1/2 x 1-1/2	73.0	48.3	89.0
NPS 2-1/2 x 1-1/4	73.0	42.2	89.0
NPS 2-1/2 x 1	73.0	33.4	89.0
NPS 3 x 2-1/2	88.9	73.0	89.0
NPS 3 x 2	88.9	60.3	89.0
NPS 3 x 1-1/2	88.9	48.3	89.0
NPS 3 x 1-1/4	88.9	42.2	89.0
NPS 3-1/2 x 3	101.6	88.9	102.0
NPS 3-1/2 x 2-1/2	101.6	73.0	102.0

ECCENTRIC AND CONCENTRIC REDUCERS - cont.

NPS 3-1/2 x 2	101.6	60.3	102.0
NPS 3-1/2 x 1-1/2	101.6	48.3	102.0
NPS 3-1/2 x 1-1/4	101.6	42.2	102.0
NPS 4 x 3-1/2	114.3	101.6	102.0
NPS 4 x 3	114.3	88.9	102.0
NPS 4 x 2-1/2	114.3	73.0	102.0
NPS 4 x 2	114.3	60.3	102.0
NPS 4 x 1-1/2	114.3	48.3	102.0
NPS 5 x 4	141.3	114.3	127.0
NPS 5 x 3-1/2	141.3	101.6	127.0
NPS 5 x 3	141.3	88.9	127.0
NPS 5 x 2-1/2	141.3	73.0	127.0
NPS 5 x 2	141.3	60.3	127.0
NPS 6 x 5	168.3	141.3	140.0
NPS 6 x 4	168.3	114.3	140.0
NPS 6 x 3-1/2	168.3	101.6	140.0
NPS 6 x 3	168.3	88.9	140.0
NPS 6 x 2-1/2	168.3	73.0	140.0
NPS 8 x 6	219.1	168.3	152.0
NPS 8 x 5	219.1	141.3	152.0
NPS 8 x 4	219.1	114.3	152.0
NPS 8 x 3-1/2	219.1	101.6	152.0
NPS 10 x 8	273.1	219.1	178.0
NPS 10 x 6	273.1	168.3	178.0
NPS 10 x 5	273.1	141.3	178.0
NPS 10 x 4	273.1	114.3	178.0
NPS 12 x 10	323.9	273.1	203.0
NPS 12 x 8	323.9	219.1	203.0
NPS 12 x 6	323.9	168.3	203.0
NPS 12 x 5	323.9	141.4	203.0
NPS 14 x 12	355.6	323.9	330.0
NPS 14 x 10	355.6	273.1	330.0
NPS 14 x 8	355.6	219.1	330.0
NPS 14 x 6	355.6	168.3	330.0
NPS 16 x 14	406.4	355.6	356.0
NPS 16 x 12	406.4	323.9	356.0
NPS 16 x 10	406.4	273.1	356.0
NPS 16 x 8	406.4	219.1	356.0

NPS 18 x 16	457.0	406.4	381.0
NPS 18 x 14	457.0	355.6	381.0
NPS 18 x 12	457.0	323.9	381.0
NPS 18 x 10	457.0	273.1	381.0
NPS 20 x 18	508.0	457.0	508.0
NPS 20 x 16	508.0	406.4	508.0
NPS 20 x 14	508.0	355.6	508.0
NPS 20 x 12	508.0	323.9	508.0
NPS 22 x 20	559.0	508.0	508.0
NPS 22 x 18	559.0	457.0	508.0
NPS 22 x 16	559.0	406.4	508.0
NPS 22 x 14	559.0	355.6	508.0
NPS 24 x 22	610.0	559.0	508.0
NPS 24 x 20	610.0	508.0	508.0
NPS 24 x 18	610.0	457.0	508.0
NPS 24 x 16	610.0	406.4	508.0
NPS 26 x 24	660.0	610.0	610.0
NPS 26 x 22	660.0	559.0	610.0
NPS 26 x 20	660.0	508.0	610.0
NPS 26 x 18	660.0	457.0	610.0
NPS 28 x 26	711.0	660.0	610.0
NPS 28 x 24	711.0	610.0	610.0
NPS 28 x 20	711.0	508.0	610.0
NPS 28 x 18	711.0	457.0	610.0
NPS 30 x 28	762.0	711.0	610.0
NPS 30 x 26	762.0	660.0	610.0
NPS 30 x 24	762.0	610.0	610.0
NPS 30 x 20	762.0	508.0	610.0
NPS 32 x 30	813.0	762.0	610.0
NPS 32 x 28	813.0	711.0	610.0
NPS 32 x 26	813.0	660.0	610.0
NPS 32 x 24	813.0	610.0	610.0
NPS 34 x 32	864.0	813.0	610.0
NPS 34 x 30	864.0	762.0	610.0
NPS 34 x 26	864.0	660.0	610.0
NPS 34 x 24	864.0	610.0	610.0
NPS 36 x 34	914.0	864.0	610.0
NPS 36 x 32	914.0	813.0	610.0

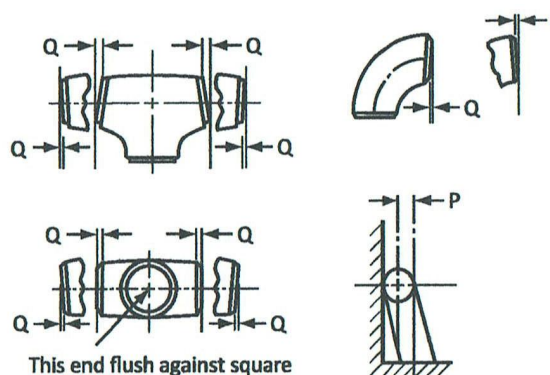
NPS 36 x 30	914.0	762.0	610.0
NPS 36 x 26	914.0	660.0	610.0
NPS 36 x 24	914.0	610.0	610.0
NPS 38 x 36	965.0	914.0	610.0
NPS 38 x 34	965.0	864.0	610.0
NPS 38 x 32	965.0	813.0	610.0
NPS 38 x 30	965.0	762.0	610.0
NPS 38 x 28	965.0	711.0	610.0
NPS 38 x 26	965.0	660.0	610.0
NPS 40 x 38	1016.0	965.0	610.0
NPS 40 x 36	1016.0	914.0	610.0
NPS 40 x 34	1016.0	864.0	610.0
NPS 40 x 32	1016.0	813.0	610.0
NPS 40 x 30	1016.0	762.0	610.0
NPS 42 x 40	1067.0	1016.0	610.0
NPS 42 x 38	1067.0	965.0	610.0
NPS 42 x 36	1067.0	914.0	610.0
NPS 42 x 34	1067.0	864.0	610.0
NPS 42 x 32	1067.0	813.0	610.0
NPS 42 x 30	1067.0	762.0	610.0
NPS 44 x 42	1118.0	1067.0	610.0
NPS 44 x 40	1118.0	1016.0	610.0
NPS 44 x 38	1118.0	965.0	610.0
NPS 44 x 36	1118.0	914.0	610.0
NPS 46 x 44	1168.0	1118.0	711.0
NPS 46 x 42	1168.0	1067.0	711.0
NPS 46 x 40	1168.0	1016.0	711.0
NPS 46 x 38	1168.0	965.0	711.0
NPS 48 x 46	1219.0	1168.0	711.0
NPS 48 x 44	1219.0	1118.0	711.0
NPS 48 x 42	1219.0	1067.0	711.0
NPS 48 x 40	1219.0	1016.0	711.0



CAPS

SIZE	Outside Diameter at Bevel in MM	Length "E" in mm
NPS 1/2	21.3	25
NPS 3/4	26.7	25
NPS 1	33.4	38
NPS 1-1/4	42.2	38
NPS 1-1/2	48.3	38
NPS 2	60.3	38
NPS 2-1/2	73	38
NPS 3	88.9	51
NPS 3-1/2	101.6	64
NPS 4	114.3	64
NPS 5	141.3	76
NPS 6	168.3	89
NPS 8	219.1	102
NPS 10	273.1	127
NPS 12	323.9	152
NPS 14	355.6	165
NPS 16	406.4	178
NPS 18	457	203
NPS 20	508	229
NPS 22	559	254
NPS 24	310	267
NPS 26	660	267
NPS 28	711	267
NPS 30	762	267

TOLERANCE FOR STANDARD FITTING OF A LOWER GRADE THEN 290



SIZE	INSIDE DIA AT END	OUT OF ROUND	CENTER TO END SR & LR ELBOWS & TEES A,B, C,M	REDUCER S LENGTH OVERALL H	CAPS LENGTH OVERALL E	OFF ANGLE ELBOWS, TEES REDUCERS Q	ELBOW OFF PLANE P	REDUCER CENTER LINE OFFSE
NPS 1/2 to NPS 2-1/2 inclusive	± 1	2	± 2	± 2	± 4	1	2	3%
NPS 3 to NPS 3-1/2 inclusive	± 2	2	± 2	± 2	± 4	1	2	3%
NPS 4	± 2	3	± 2	± 2	± 4	1	2	3%
NPS 5 to NPS 6 inclusive	± 2	4	± 2	± 2	± 7	2	4	3%
NPS 8	± 2	4	± 2	± 2	± 7	2	4	3%
NPS 10	± 3	7	± 2	± 2	± 7	3	5	3%
NPS 12	± 3	7	± 3	± 3	± 7	5	5	3%
NPS 14 to NPS 16 inclusive	± 3	7	± 3	± 3	± 7	5	7	3%
NPS 18	± 3	7	± 3	± 3	± 7	4	10	3%
NPS 20 to NPS 24 inclusive	± 5	11	± 3	± 3	± 7	4	10	3%
NPS 26 to NPS 30 inclusive	± 5	12	± 3	± 3	± 10	5	10	3%
NPS 32 to NPS 42 inclusive	± 5	12	± 5	± 5	± 10	5	13	3%
NPS 44 to NPS 48 inclusive	± 5	12	± 5	± 5	± 10	5	20	3%

Notes:

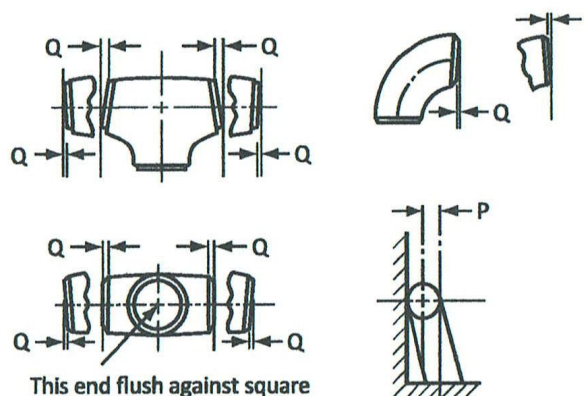
- 1) The out-of-roundness tolerance shall be the difference between the maximum and minimum inside diameters measured on any radial cross section at the end of the fitting.
- 2) Where tolerances are given in percentages, the tolerance applies to the nominal diameter expressed in millimetres.
- 3) For reducing tees, the run size shall be used to determine the tolerance of the centre-to-end dimension of the outlet.
- 4) For reducers, the larger dimension shall be used to determine the length tolerance.
- 5) All tolerances, except as noted, are in millimetres.

DISCLAIMER

THIS DATA IS INTENDED FOR REFERENCE ONLY, TO SHOW THE FITTINGS MANUFACTURED BY APCO PIPE FITTINGS CO. LTD. ALTHOUGH CARE HAS BEEN TAKEN TO INSURE THAT THE DATA IS CORRECT, IT IS NOT INTENDED FOR USE TO MANUFACTURE OR INSPECT PIPE FITTINGS MANUFACTURED TO CSA Z245.11 . PLEASE REFER TO CSA Z245.11 FOR COMPLETE DETAILS

CSA Z245.11

TOLERANCE FOR STANDARD FITTING OF A GRADE 290 AND ABOVE



SIZE	INSIDE DIA AT END	OUT OF ROUND ELBOWS	OUT OF ROUND OTHER	CENTER TO END SR & LR ELBOWS & TEES A,B, C,M	CENTER TO END DIMENSION 3R ELBOWS	REDUCER S LENGTH OVERALL H
NPS 1/2 to NPS 24 inclusive	± 2	5	3	± 2	± 3	± 2
NPS 26 to NPS 36 inclusive	± 2	1%	3	± 3	± 6	± 5
NPS 38 to NPS 48 inclusive	± 3	1%	3	± 5	± 10	± 10

SIZE	CAPS LENGTH OVERALL E	OFF ANGLE ELBOWS, TEES REDUCER S Q	ELBOW OFF PLANE P	REDUCER CENTER LINE OFFSE
NPS 1/2 to NPS 24 inclusive	± 7	2	6	3%
NPS 26 to NPS 36 inclusive	± 10	2	13	3%
NPS 38 to NPS 48 inclusive	± 10	3	19	3%

Notes:

- 1) The out-of-roundness tolerance shall be the difference between the maximum and minimum inside diameters measured on any radial cross section at the end of the fitting. In addition, NPS 18 and larger elbows shall be not more than 3% out of round throughout their length
- 2) Where tolerances are given in percentages, the tolerance applies to the nominal diameter expressed in millimetres.
- 3) For reducing tees, the run size shall be used to determine the tolerance of the centre-to-end dimension of the outlet.
- 4) For reducers, the larger dimension shall be used to determine the length tolerance
- 5) All tolerances, except as noted, are in millimetres.

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1000 Ton Hydraulic Press



Hydraulic Tee Machine



Elbow Beveling Machine



Hot Induction Bend Machine



Elbow Workshop



Hot Induction Elbow Making Machine





Mechanical Test Machine



Chemical Analysis Spectrometer



Impact Testing Machine



Hydro Test



Export Packing Shop



Heat Treatment



Stamping



Advanced BW Fittings Painting Line



Iron Ball Shot Blasting



Hot Induction Bneds Being loaded



Delivery Facilities

STEEL BUTT-WELDING PIPE FITTINGS



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