



 **MIE TECHNO**
CO.,LTD.

***STAINLESS STEEL
BUTT-WELDING
FITTINGS***



MIE TECHNO MINISTERS TO YOUR WANTS. STABLE QUALITY, THOROUGHGOING PROCESS CONTROL, VERSATILE SERVICE SYSTEM, AND A RICH ASSORTMENT IN SIZE.

QUALITY

MIE TECHNO's products manufactured under perfect quality control with excellent techniques coupled with rich experiences have the confidence of users.

PROCESS CONTROL & SERVICE SYSTEM

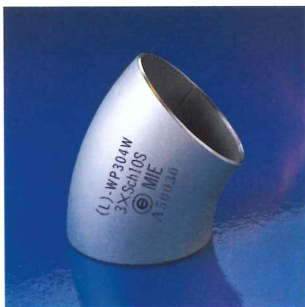
Manufacturing processes improved reasonably and controlled to perfection bring forth faultless products exactly in time as order.

VARIETY OF SIZES

In order to fill a wider range of requirements, we have improved the structure and are manufacturing smaller/larger sized pipes and thinner/thicker ones as well as the conventional products.

INSPECTION

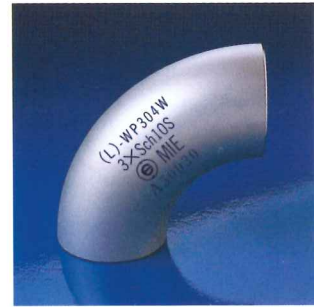
- Material acceptance inspection (making sure of material quality)
- Welding inspection, non-destructive inspection (liquid penetrant test, radiographic test)
- Pressure test (hydrostatic test)
- Dimensional inspection
- Appearance check
- Others, such as ultrasonic test, eddy current test, Charpy impact test, corrosion test, etc., will be conducted upon request.



45° Long Radius Elbow



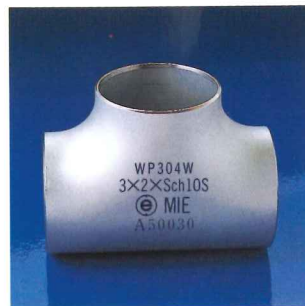
90° Short Radius Elbow



90° Long Radius Elbow



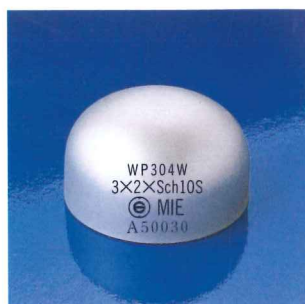
Reducing Outlet Tee



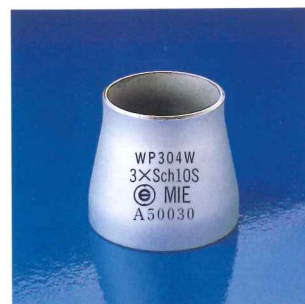
Straight Tee



Lap-Joint Stub End



Cap



Concentric Reducer



Eccentric Reducer

MATERIAL FOR WROUGHT AUSTENITIC STAINLESS STEEL PIPING FITTING

American Standards applied in this catalogue are the latest edition as of January 2003, respectively.

ASTM A 403/A 403M-02

Chemical Requirements

Grade ^A			Composition, %								
Grade WP	Grade CR	UNS Designation	C max.	Mn max.	P max.	S max.	Si max.	Ni	Cr	Mo	Ti
WP304	CR304	S30400	0.08	2.00	0.045	0.030	1.00	8.0-11.0	18.0-20.0	...	...
WP304L	CR304L	S30403	0.030 ^B	2.00	0.045	0.030	1.00	8.0-12.0	18.0-20.0	...	...
WP304H	CR304H	S30409	0.04-0.10	2.00	0.045	0.030	1.00	8.0-11.0	18.0-20.0	...	...
WP310S	CR310S	S31008	0.08	2.00	0.045	0.030	1.00	19.0-22.0	24.0-26.0	...	...
WP316	CR316	S31600	0.08	2.00	0.045	0.030	1.00	10.0-14.0	16.0-18.0	2.00-3.00	
WP316L	CR316L	S31603	0.030 ^B	2.00	0.045	0.030	1.00	10.0-14.0 ^C	16.0-18.0	2.00-3.00	
WP316H	CR316H	S31609	0.04-0.10	2.00	0.045	0.030	1.00	10.0-14.0	16.0-18.0	2.00-3.00	
WP321	CR321	S32100	0.08	2.00	0.045	0.030	1.00	9.0-12.0	17.0-19.0	...	D
WP321H	CR321H	S32109	0.04-0.10	2.00	0.045	0.030	1.00	9.0-12.0	17.0-19.0	...	E

NOTES:

A: In addition to the WP Grade designation, WP fittings shall be marked with the following Fitting Class

Fitting Classes for WP Grades

Class	Construction	Nondestructive Examination
S	Seamless	None
W	Welded	Radiography or Ultrasonic
WX	Welded	Radiography
WU	Welded	Ultrasonic

B: For small diameter or thin walls, or both, where many drawing passes are required, a carbon maximum of 0.040% is necessary in grades TP304L and TP316L. Small outside diameter tubes are defined as those less than 0.500in in outside diameter and light wall tubes as those less than 0.049in in average wall thickness.

C: On pierced tubing, the nickel may be 11.0–16.0%.

D: $5 \times (C+N_2) - 0.70$ (The titanium content shall be not less than five times the carbon content plus nitrogen content and not more than 0.70%)

E: $4 \times (C+N_2) - 0.70$ (The titanium content shall be not less than four times the carbon content plus nitrogen content and not more than 0.70%)

Tensile Requirements

All WP and CR Grades	Yield Strength min. ksi (Mpa)	Tensile Strength min. ksi (Mpa)	Elongation Requirements		
			Longitudinal	Transverse	
304, 304H, 310, 316, 316H, 321, 321H	30 (205)	75 (515)	Standard round specimen, or small proportional specimen, or strip-type specimen, minimum % in 4D	28	20
304L, 316L	25 (170)	70 (485)			

Heat Treatment

All fittings shall be furnished in the heat-treated condition.

For H grades, separate solution heat treatments are required for solution annealing; in-process heat treatments are not permitted as a substitute for the separate solution annealing treatments.

The heat-treat procedure, except for 321 and 321H, shall consist of solution annealing the fittings at a minimum temperature of 1900°F (1040°C) until the chromium carbides go into solution, and then cooling at a sufficient rate to prevent reprecipitation.

A solution annealing temperature above 1950°F (1065°C) may impair the resistance to intergranular corrosion after subsequent exposure to sensitizing conditions in 321 and 321H.

All welding shall be done prior to heat treatment.

DIMENSIONS OF WELDED & SEAMLESS STAINLESS STEEL PIPE

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ANSI/ASME B36.19M

CUSTOMARY UNITS

Dimensions in inches

Inch Nominal Pipe Size	Outside Diameter in.	Nominal Wall Thickness			
		Schedule 5S	Schedule 10S	Schedule 40S	Schedule 80S
1/8	0.405	...	0.049	0.068	0.095
1/4	0.540	...	0.065	0.088	0.119
3/8	0.675	...	0.065	0.091	0.126
1/2	0.840	0.065	0.083	0.109	0.147
3/4	1.050	0.065	0.083	0.113	0.154
1	1.315	0.065	0.109	0.133	0.179
1 1/4	1.660	0.065	0.109	0.140	0.191
1 1/2	1.900	0.065	0.109	0.145	0.200
2	2.375	0.065	0.109	0.154	0.218
2 1/2	2.875	0.083	0.120	0.203	0.276
3	3.500	0.083	0.120	0.216	0.300
3 1/2	4.000	0.083	0.120	0.226	0.318
4	4.500	0.083	0.120	0.237	0.337
5	5.563	0.109	0.134	0.258	0.375
6	6.625	0.109	0.134	0.280	0.432
8	8.625	0.109	0.148	0.322	0.500
10	10.750	0.134	0.165	0.365	0.500 (1)
12	12.750	0.156	0.180	0.375 (1)	0.500 (1)
14	14.000	0.156	0.188 (1)	0.375 (1)	...
16	16.000	0.165	0.188 (1)	0.375 (1)	...
18	18.000	0.165	0.188 (1)	0.375 (1)	...
20	20.000	0.188	0.218 (1)	0.375 (1)	...
22	22.000	0.188	0.218 (1)	0.375 (1)	...
24	24.000	0.218	0.250	0.375 (1)	...
30	30.000	0.250	0.312	0.375 (1)	...

NOTES:

- (1) These dimensions do not conform to ANSI/ASME B36.19M.
- (2) For tolerances, permissible variations for dimensions are indicated in each specification listed below.

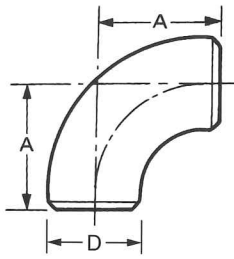
Specifications for pipe with ASTM designations and titles of standards specifications

ASTM Designation	Title
A312	Specifications for Seamless and Welded Austenitic Stainless Steel Pipe
A358	Specifications for Electric-Fusion-Welded Austenitic Chromium-Nickel Alloy Steel Pipe for High-Temperature Service
A376	Specifications for Seamless Austenitic Steel Pipe for High-Temperature Central-Station Service
A409	Specifications for Welded Large Diameter Austenitic Steel Pipe for Corrosive or High-Temperature Service

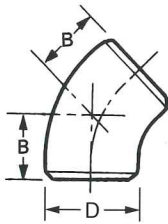
DIMENSIONS OF LONG RADIUS ELBOW

ASME B16.9 • MSS SP-43

Dimensions in inches



90 deg. ELBOWS



45 deg. ELBOWS

Nominal Pipe Size (NPS)	Outside Diameter at Bevel D	Center-to-End	
		90 deg. Elbows A	45 deg. Elbows B
1/2	0.84	1.50	0.62
3/4 (1)	1.05	1.50 (1.12)	0.75 (0.44)
1	1.32	1.50	0.88
1 1/4	1.66	1.88	1.00
1 1/2	1.90	2.25	1.12
2	2.38	3.00	1.38
2 1/2	2.88	3.75	1.75
3	3.50	4.50	2.00
3 1/2	4.00	5.25	2.25
4	4.50	6.00	2.50
5	5.56	7.50	3.12
6	6.62	9.00	3.75
8	8.62	12.00	5.00
10	10.75	15.00	6.25
12	12.75	18.00	7.50
14	14.00	21.00	8.75
16	16.00	24.00	10.00
18	18.00	27.00	11.25
20	20.00	30.00	12.50
22	22.00	33.00	13.50
24	24.00	36.00	15.00
26	26.00	39.00	16.00
28	28.00	42.00	17.25
30	30.00	45.00	18.50
32	32.00	48.00	19.75
34	34.00	51.00	21.00
36	36.00	54.00	22.25
38	38.00	57.00	23.62
40	40.00	60.00	24.88
42	42.00	63.00	26.00
44	44.00	66.00	27.38
46	46.00	69.00	28.62
48	48.00	72.00	29.88

NOTES:

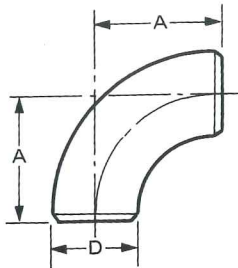
- (1) In accordance with MSS SP-43, A and B dimensions of (1.12in.) and (0.44in.) respectively may be furnished for NPS 3/4 at the manufacturer's option.
- (2) Dimensions for MSS SP-43 cover NPS 1/2 through NPS 24.

DIMENSIONS OF SHORT RADIUS ELBOW AND RETURN

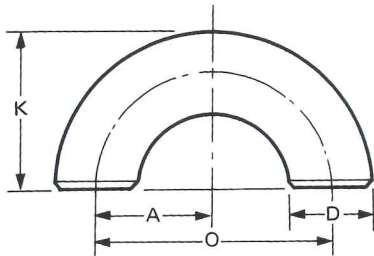
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ASME B16.9 • ASME B16.28

Dimensions in inches



**SHORT RADIUS
ELBOW**



**SHORT RADIUS
180 deg. RETURNS**

Nominal Pipe Size	Outside Diameter at Bevel D	Center-to-End A (1)	Center-to-Center O	Back-to-Face K
1	1.32	1.00	2.00	1.62
1 ¹ / ₄	1.66	1.25	2.50	2.06
1 ¹ / ₂	1.90	1.50	3.00	2.44
2	2.38	2.00	4.00	3.19
2 ¹ / ₂	2.88	2.50	5.00	3.94
3	3.50	3.00	6.00	4.75
3 ¹ / ₂ (2)	4.00	3.40 (3.50)	7.00	5.50
4	4.50	4.00	8.00	6.25
5	5.56	5.00	10.00	7.75
6	6.62	6.00	12.00	9.31
8	8.62	8.00	16.00	12.31
10	10.75	10.00	20.00	15.38
12	12.75	12.00	24.00	18.38
14	14.00	14.00	28.00	21.00
16	16.00	16.00	32.00	24.00
18	18.00	18.00	36.00	27.00
20	20.00	20.00	40.00	30.00
22	22.00	22.00	44.00	33.00
24	24.00	24.00	48.00	36.00

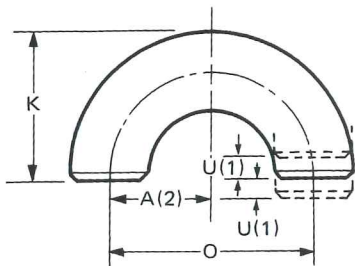
NOTES:

- (1) Dimension A is equal to one-half of dimension O.
- (2) In accordance with ASME B16.28, dimension A of (3.50in.) may be furnished for NPS 3¹/₂.

DIMENSIONS OF LONG RADIUS RETURN

ASME B16.9 • MSS SP-43

Dimensions in inches



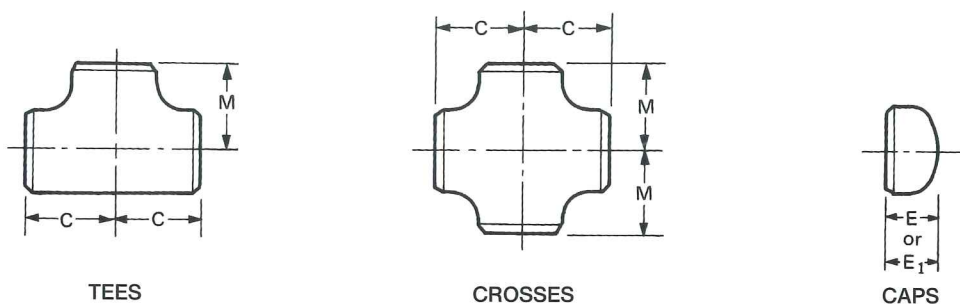
NOTES:

- (1) Tolerance for alignment of ends U for NPS 8 and smaller is ± 0.03in. and for NPS 10 and larger ± 0.06in.
- (2) Dimension A is equal to one-half of dimension O.
- (3) In accordance with MSS SP-43, O and K dimensions of (2.25in.) and (1.69in.) respectively, may be furnished for NPS 3⁴/₄ at the manufacturer's option.
- (4) Dimensions for NPS 22 are not specified in MSS SP-43.

Nominal Pipe Size	Outside Diameter at Bevel	Center-to-Center O	Back-to-Face (3) K
1/2	0.84	3.00	1.88
3/4 (3)	1.05	3.00 (2.25)	2.00 (1.69)
1	1.32	3.00	2.19
1 ¹ / ₄	1.66	3.75	2.75
1 ¹ / ₂	1.90	4.50	3.25
2	2.38	6.00	4.19
2 ¹ / ₂	2.88	7.50	5.19
3	3.50	9.00	6.25
3 ¹ / ₂	4.00	10.50	7.25
4	4.50	12.00	8.25
5	5.56	15.00	10.31
6	6.62	18.00	12.31
8	8.62	24.00	16.31
10	10.75	30.00	20.38
12	12.75	36.00	24.38
14	14.00	42.00	28.00
16	16.00	48.00	32.00
18	18.00	54.00	36.00
20	20.00	60.00	40.00
22 (4)	22.00	66.00	44.00
24	24.00	72.00	48.00

DIMENSIONS OF STRAIGHT TEES, CROSSES AND CAP

ASME B16.9 • MSS SP-43



Dimensions in inches

Nominal Pipe Size (NPS)	Outside Diameter at Bevel D	Center-to-End		Length (3) E	Limiting Wall Thickness for Length E	Length (4) E ₁
		Run C	Outlet (1), (2) M			
1/2	0.84	1.00	1.00	1.00	0.18	1.00
3/4	1.05	1.12	1.12	1.00	0.15	1.00
1	1.32	1.50	1.50	1.50	0.18	1.50
1 1/4	1.66	1.88	1.88	1.50	0.19	1.50
1 1/2	1.90	2.25	2.25	1.50	0.20	1.50
2	2.38	2.50	2.50	1.50	0.22	1.75
2 1/2	2.88	3.00	3.00	1.50	0.28	2.00
3	3.50	3.38	3.38	2.00	0.30	2.50
3 1/2	4.00	3.75	3.75	2.50	0.32	3.00
4	4.50	4.12	4.12	2.50	0.34	3.00
5	5.56	4.88	4.88	3.00	0.38	3.50
6	6.62	5.62	5.62	3.50	0.43	4.00
8	8.62	7.00	7.00	4.00	0.50	5.00
10	10.75	8.50	8.50	5.00	0.50	6.00
12	12.75	10.00	10.00	6.00	0.50	7.00
14	14.00	11.00	11.00	6.50	0.50	7.50
16	16.00	12.00	12.00	7.00	0.50	8.00
18	18.00	13.50	13.50	8.00	0.50	9.00
20	20.00	15.00	15.00	9.00	0.50	10.00
22	22.00	16.50	16.50	10.00	0.50	10.00
24	24.00	17.00	17.00	10.50	0.50	12.00
26	26.00	19.50	19.50	10.50	...	...
28	28.00	20.50	20.50	10.50	...	...
30	30.00	22.00	22.00	10.50	...	...
32	32.00	23.50	23.50	10.50	...	...
34	34.00	25.00	25.00	10.50	...	...
36	36.00	26.50	26.50	10.50	...	...
38	38.00	28.00	28.00	12.00	...	...
40	40.00	29.50	29.50	12.00	...	...
42	42.00	30.00	28.00	12.00	...	...
44	44.00	32.00	30.00	13.50	...	...
46	46.00	33.50	31.50	13.50	...	...
48	48.00	35.00	33.00	13.50	...	...

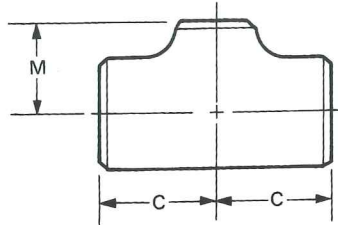
NOTES:

- (1) Outlet dimension M for NPS 26 and larger is recommended but not required.
- (2) Dimensions applicable to crosses NPS 24 and smaller.
- (3) Length E applies for thickness not exceeding that given in column "Limiting Wall Thickness for Length E."
- (4) Length E₁ applies for thickness greater than that given in column "Limiting Wall Thickness" for NPS 24 and smaller. For NPS 26 and larger, length E₁ shall be by agreement between the manufacturer and purchaser. Length E₁ is not specified in MSS SP-43.
- (5) Dimensions applicable to cap in MSS SP-43 are NPS 24 and smaller with the exception of NPS 22.
- (6) The shape of these caps shall be ellipsoidal and shall conform to the sharp requirements as given in the ASME Boiler and Pressure Vessel Code.

DIMENSIONS OF REDUCING OUTLET TEES

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ASME B16.9 • MSS SP-43

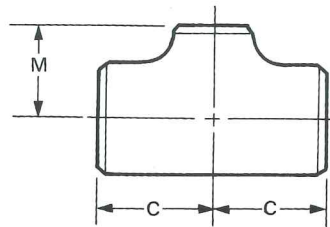


Dimensions in inches

Nominal Pipe Size (NPS)	Outside Diameter at Bevel D		Center-to-End		Nominal Pipe Size (NPS)	Outside Diameter at Bevel D		Center-to-End	
	Run	Outlet	Run C	Outlet (1) M		Run	Outlet	Run C	Outlet (1) M
1/2×1/2×3/8	0.84	0.68	1.00	1.00	6×6×5	6.62	5.56	5.62	5.38
1/2×1/2×1/4	0.84	0.54	1.00	1.00	6×6×4	6.62	4.50	5.62	5.12
3/4×3/4×1/2	1.05	0.84	1.12	1.12	6×6×3 1/2	6.62	4.00	5.62	5.00
3/4×3/4×3/8	1.05	0.68	1.12	1.12	6×6×3	6.62	3.50	5.62	4.88
1×1×3/4	1.32	1.05	1.50	1.50	6×6×2 1/2	6.62	2.88	5.62	4.75
1×1×1/2	1.32	0.84	1.50	1.50	8×8×6	8.62	6.62	7.00	6.62
1 1/4×1 1/4×1	1.66	1.32	1.88	1.88	8×8×5	8.62	5.56	7.00	6.38
1 1/4×1 1/4×3/4	1.66	1.05	1.88	1.88	8×8×4	8.62	4.50	7.00	6.12
1 1/4×1 1/4×1/2	1.66	0.84	1.88	1.88	8×8×3 1/2	8.62	4.00	7.00	6.00
1 1/2×1 1/2×1 1/4	1.90	1.66	2.25	2.25	10×10×8	10.75	8.62	8.50	8.00
1 1/2×1 1/2×1	1.90	1.32	2.25	2.25	10×10×6	10.75	6.62	8.50	7.62
1 1/2×1 1/2×3/4	1.90	1.05	2.25	2.25	10×10×5	10.75	5.56	8.50	7.50
1 1/2×1 1/2×1/2	1.90	0.84	2.25	2.25	10×10×4	10.75	4.50	8.50	7.25
2×2×1 1/2	2.38	1.90	2.50	2.38	12×12×10	12.75	10.75	10.00	9.50
2×2×1 1/4	2.38	1.66	2.50	2.25	12×12×8	12.75	8.62	10.00	9.00
2×2×1	2.38	1.32	2.50	2.00	12×12×6	12.75	6.62	10.00	8.62
2×2×3/4	2.38	1.05	2.50	1.75	12×12×5	12.75	5.56	10.00	8.50
2 1/2×2 1/2×2	2.88	2.38	3.00	2.75	14×14×12	14.00	12.75	11.00	10.62
2 1/2×2 1/2×1 1/2	2.88	1.90	3.00	2.62	14×14×10	14.00	10.75	11.00	10.12
2 1/2×2 1/2×1 1/4	2.88	1.66	3.00	2.50	14×14×8	14.00	8.62	11.00	9.75
2 1/2×2 1/2×1	2.88	1.32	3.00	2.25	14×14×6	14.00	6.62	11.00	9.38
3×3×2 1/2	3.50	2.88	3.38	3.25	16×16×14	16.00	14.00	12.00	12.00
3×3×2	3.50	2.38	3.38	3.00	16×16×12	16.00	12.75	12.00	11.62
3×3×1 1/2	3.50	1.90	3.38	2.88	16×16×10	16.00	10.75	12.00	11.12
3×3×1 1/4	3.50	1.66	3.38	2.75	16×16×8	16.00	8.62	12.00	10.75
3 1/2×3 1/2×3	4.00	3.50	3.75	3.62	16×16×6	16.00	6.62	12.00	10.38
3 1/2×3 1/2×2 1/2	4.00	2.88	3.75	3.50	18×18×16	18.00	16.00	13.50	13.00
3 1/2×3 1/2×2	4.00	2.38	3.75	3.25	18×18×14	18.00	14.00	13.50	13.00
3 1/2×3 1/2×1 1/2	4.00	1.90	3.75	3.12	18×18×12	18.00	12.75	13.50	12.62
4×4×3 1/2	4.50	4.00	4.12	4.00	18×18×10	18.00	10.75	13.50	12.12
4×4×3	4.50	3.50	4.12	3.88	18×18×8	18.00	8.62	13.50	11.75
4×4×2 1/2	4.50	2.88	4.12	3.75	20×20×18	20.00	18.00	15.00	14.50
4×4×2	4.50	2.38	4.12	3.50	20×20×16	20.00	16.00	15.00	14.00
4×4×1 1/2	4.50	1.90	4.12	3.38	20×20×14	20.00	14.00	15.00	14.00
5×5×4	5.56	4.50	4.88	4.62	20×20×12	20.00	12.75	15.00	13.62
5×5×3 1/2	5.56	4.00	4.88	4.50	20×20×10	20.00	10.75	15.00	13.12
5×5×3	5.56	3.50	4.88	4.38	20×20×8	20.00	8.62	15.00	12.75
5×5×2 1/2	5.56	2.88	4.88	4.25	22×22×20	22.00	20.00	16.50	16.00
5×5×2	5.56	2.38	4.88	4.12	22×22×18	22.00	18.00	16.50	15.50

DIMENSIONS OF REDUCING OUTLET TEES

ASME B16.9•MSS SP-43

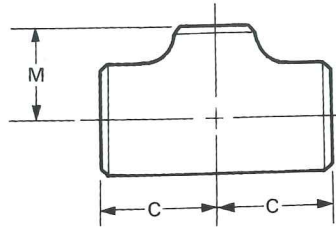


Dimensions in inches

Nominal Pipe Size (NPS)	Outside Diameter at Bevel D		Center-to-End		Nominal Pipe Size (NPS)	Outside Diameter at Bevel D		Center-to-End	
	Run	Outlet	Run C	Outlet (1) M		Run	Outlet	Run C	Outlet (1) M
22×22×16	22.00	16.00	16.50	15.00	34×34×24	34.00	24.00	25.00	23.00
22×22×14	22.00	14.00	16.50	15.00	34×34×22	34.00	22.00	25.00	22.50
22×22×12	22.00	12.75	16.50	14.62	34×34×20	34.00	20.00	25.00	22.00
22×22×10	22.00	10.75	16.50	14.12	34×34×18	34.00	18.00	25.00	21.50
24×24×22	24.00	22.00	17.00	17.00	34×34×16	34.00	16.00	25.00	21.00
24×24×20	24.00	20.00	17.00	17.00	36×36×34	36.00	34.00	26.50	26.00
24×24×18	24.00	18.00	17.00	16.50	36×36×32	36.00	32.00	26.50	25.50
24×24×16	24.00	16.00	17.00	16.00	36×36×30	36.00	30.00	26.50	25.00
24×24×14	24.00	14.00	17.00	16.00	36×36×28	36.00	28.00	26.50	24.50
24×24×12	24.00	12.75	17.00	15.62	36×36×26	36.00	26.00	26.50	24.50
24×24×10	24.00	10.75	17.00	15.12	36×36×24	36.00	24.00	26.50	24.00
26×26×24	26.00	24.00	19.50	19.00	36×36×22	36.00	22.00	26.50	23.50
26×26×22	26.00	22.00	19.50	18.50	36×36×20	36.00	20.00	26.50	23.00
26×26×20	26.00	20.00	19.50	18.00	36×36×18	36.00	18.00	26.50	22.50
26×26×18	26.00	18.00	19.50	17.50	36×36×16	36.00	16.00	26.50	22.00
26×26×16	26.00	16.00	19.50	17.00	38×38×36	38.00	36.00	28.00	28.00
26×26×14	26.00	14.00	19.50	17.00	38×38×34	38.00	34.00	28.00	27.50
26×26×12	26.00	12.75	19.50	16.62	38×38×32	38.00	32.00	28.00	27.00
28×28×26	28.00	26.00	20.50	20.50	38×38×30	38.00	30.00	28.00	26.50
28×28×24	28.00	24.00	20.50	20.00	38×38×28	38.00	28.00	28.00	25.50
28×28×22	28.00	22.00	20.50	19.50	38×38×26	38.00	26.00	28.00	25.50
28×28×20	28.00	20.00	20.50	19.00	38×38×24	38.00	24.00	28.00	25.00
28×28×18	28.00	18.00	20.50	18.50	38×38×22	38.00	22.00	28.00	24.50
28×28×16	28.00	16.00	20.50	18.00	38×38×20	38.00	20.00	28.00	24.00
28×28×14	28.00	14.00	20.50	18.00	38×38×18	38.00	18.00	28.00	23.50
28×28×12	28.00	12.75	20.50	17.62	40×40×38	40.00	38.00	29.50	29.50
30×30×28	30.00	28.00	22.00	21.50	40×40×36	40.00	36.00	29.50	29.00
30×30×26	30.00	26.00	22.00	21.50	40×40×34	40.00	34.00	29.50	28.50
30×30×24	30.00	24.00	22.00	21.00	40×40×32	40.00	32.00	29.50	28.00
30×30×22	30.00	22.00	22.00	20.50	40×40×30	40.00	30.00	29.50	27.50
30×30×20	30.00	20.00	22.00	20.00	40×40×28	40.00	28.00	29.50	26.50
30×30×18	30.00	18.00	22.00	19.50	40×40×26	40.00	26.00	29.50	26.50
30×30×16	30.00	16.00	22.00	19.00	40×40×24	40.00	24.00	29.50	26.00
30×30×14	30.00	14.00	22.00	19.00	40×40×22	40.00	22.00	29.50	25.50
30×30×12	30.00	12.75	22.00	18.62	40×40×20	40.00	20.00	29.50	25.00
30×30×10	30.00	10.75	22.00	18.12	40×40×18	40.00	18.00	29.50	24.50
32×32×30	32.00	30.00	23.50	23.00	42×42×40	42.00	40.00	30.00	28.00
32×32×28	32.00	28.00	23.50	22.50	42×42×38	42.00	38.00	30.00	28.00
32×32×26	32.00	26.00	23.50	22.50	42×42×36	42.00	36.00	30.00	28.00
32×32×24	32.00	24.00	23.50	22.00	42×42×34	42.00	34.00	30.00	28.00
32×32×22	32.00	22.00	23.50	21.50	42×42×32	42.00	32.00	30.00	28.00
32×32×20	32.00	20.00	23.50	21.00	42×42×30	42.00	30.00	30.00	28.00
32×32×18	32.00	18.00	23.50	20.50	42×42×28	42.00	28.00	30.00	27.50
32×32×16	32.00	16.00	23.50	20.00	42×42×26	42.00	26.00	30.00	27.50
32×32×14	32.00	14.00	23.50	20.00	42×42×24	42.00	24.00	30.00	26.00
34×34×32	34.00	32.00	25.00	24.50	42×42×22	42.00	22.00	30.00	26.00
34×34×30	34.00	30.00	25.00	24.00	42×42×20	42.00	20.00	30.00	26.00
34×34×28	34.00	28.00	25.00	23.50	42×42×18	42.00	18.00	30.00	25.50
34×34×26	34.00	26.00	25.00	23.50	42×42×16	42.00	16.00	30.00	25.00

DIMENSIONS OF REDUCING OUTLET TEES

ASME B16.9·MSS SP-43



Dimensions in inches

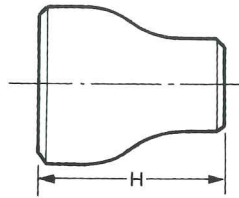
Nominal Pipe Size (NPS)	Outside Diameter at Bevel D		Center-to-End	
	Run	Outlet	Run C	Outlet (1) M
44×44×42	44.00	42.00	32.00	30.00
44×44×40	44.00	40.00	32.00	29.50
44×44×38	44.00	38.00	32.00	29.00
44×44×36	44.00	36.00	32.00	28.50
44×44×34	44.00	34.00	32.00	28.50
44×44×32	44.00	32.00	32.00	28.00
44×44×30	44.00	30.00	32.00	28.00
44×44×28	44.00	28.00	32.00	27.50
44×44×26	44.00	26.00	32.00	27.50
44×44×24	44.00	24.00	32.00	27.50
44×44×22	44.00	22.00	32.00	27.00
44×44×20	44.00	20.00	32.00	27.00
46×46×44	46.00	44.00	33.50	31.50
46×46×42	46.00	42.00	33.50	31.00
46×46×40	46.00	40.00	33.50	30.50
46×46×38	46.00	38.00	33.50	30.00
46×46×36	46.00	36.00	33.50	30.00
46×46×34	46.00	34.00	33.50	29.50
46×46×32	46.00	32.00	33.50	29.50
46×46×30	46.00	30.00	33.50	29.00
46×46×28	46.00	28.00	33.50	29.00
46×46×26	46.00	26.00	33.50	29.00
46×46×24	46.00	24.00	33.50	28.50
46×46×22	46.00	22.00	33.50	28.50
48×48×46	48.00	46.00	35.00	33.00
48×48×44	48.00	44.00	35.00	33.00
48×48×42	48.00	42.00	35.00	32.00
48×48×40	48.00	40.00	35.00	32.00
48×48×38	48.00	38.00	35.00	32.00
48×48×36	48.00	36.00	35.00	31.00
48×48×34	48.00	34.00	35.00	31.00
48×48×32	48.00	32.00	35.00	31.00
48×48×30	48.00	30.00	35.00	30.00
48×48×28	48.00	28.00	35.00	30.00
48×48×26	48.00	26.00	35.00	30.00
48×48×24	48.00	24.00	35.00	29.00
48×48×22	48.00	22.00	35.00	29.00

NOTES:

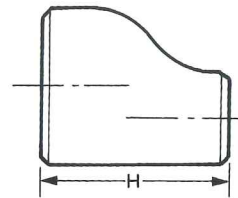
- (1) Outlet dimension M for run size 14 and large is recommended but not required..
- (2) Regarding Outside Diameter at Bevel D, run size 24" and smaller are stated in MSS SP-43.
- (3) Dimensions for NPS 22 are not specified in MSS SP-43.

DIMENSIONS OF REDUCERS

ASME B16.9·MSS SP-43



CONCENTRIC REDUCERS



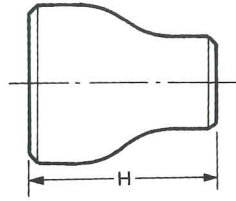
ECCENTRIC REDUCERS

Dimensions in inches

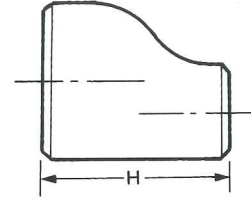
Nominal Pipe Size (NPS)	Outside Diameter at Bevel D		End-to-End H	Nominal Pipe Size (NPS)	Outside Diameter at Bevel D		End-to-End H
	Large End	Small End			Large End	Small End	
3/4×1/2	1.05	0.84	1.50	6×5	6.62	5.56	5.50
3/4×3/8	1.05	0.68	1.50	6×4	6.62	4.50	5.50
1×3/4	1.32	1.05	2.00	6×3 1/2	6.62	4.00	5.50
1×1/2	1.32	0.84	2.00	6×3	6.62	3.50	5.50
1×3/8	1.32	0.68	2.00	6×2 1/2	6.62	2.88	5.50
1 1/4×1	1.66	1.32	2.00	8×6	8.62	6.62	6.00
1 1/4×3/4	1.66	1.05	2.00	8×5	8.62	5.56	6.00
1 1/4×1/2	1.66	0.84	2.00	8×4	8.62	4.50	6.00
1 1/2×1 1/4	1.90	1.66	2.50	8×3 1/2	8.62	4.00	6.00
1 1/2×1	1.90	1.32	2.50	10×8	10.75	8.62	7.00
1 1/2×3/4	1.90	1.05	2.50	10×6	10.75	6.62	7.00
1 1/2×1/2	1.90	0.84	2.50	10×5	10.75	5.56	7.00
2×1 1/2	2.38	1.90	3.00	10×4	10.75	4.50	7.00
2×1 1/4	2.38	1.66	3.00	12×10	12.75	10.75	8.00
2×1	2.38	1.32	3.00	12×8	12.75	8.62	8.00
2×3/4	2.38	1.05	3.00	12×6	12.75	6.62	8.00
2 1/2×2	2.88	2.38	3.50	12×5	12.75	5.56	8.00
2 1/2×1 1/2	2.88	1.90	3.50	14×12	14.00	12.75	13.00
2 1/2×1 1/4	2.88	1.66	3.50	14×10	14.00	10.75	13.00
2 1/2×1	2.88	1.32	3.50	14×8	14.00	8.62	13.00
3×2 1/2	3.50	2.88	3.50	14×6	14.00	6.62	13.00
3×2	3.50	2.38	3.50	16×14	16.00	14.00	14.00
3×1 1/2	3.50	1.90	3.50	16×12	16.00	12.75	14.00
3×1 1/4	3.50	1.66	3.50	16×10	16.00	10.75	14.00
3 1/2×3	4.00	3.50	4.00	16×8	16.00	8.62	14.00
3 1/2×2 1/2	4.00	2.88	4.00	18×16	18.00	16.00	15.00
3 1/2×2	4.00	2.38	4.00	18×14	18.00	14.00	15.00
3 1/2×1 1/2	4.00	1.90	4.00	18×12	18.00	12.75	15.00
3 1/2×1 1/4	4.00	1.66	4.00	18×10	18.00	10.75	15.00
4×3 1/2	4.50	4.00	4.00	20×18	20.00	18.00	20.00
4×3	4.50	3.50	4.00	20×16	20.00	16.00	20.00
4×2 1/2	4.50	2.88	4.00	20×14	20.00	14.00	20.00
4×2	4.50	2.38	4.00	20×12	20.00	12.75	20.00
4×1 1/2	4.50	1.90	4.00	22×20	22.00	20.00	20.00
5×4	5.56	4.50	5.00	22×18	22.00	18.00	20.00
5×3 1/2	5.56	4.00	5.00	22×16	22.00	16.00	20.00
5×3	5.56	3.50	5.00	22×14	22.00	14.00	20.00
5×2 1/2	5.56	2.88	5.00				
5×2	5.56	2.38	5.00				

DIMENSIONS OF REDUCERS

ASME B16.9 • MSS SP-43



CONCENTRIC REDUCERS



ECCENTRIC REDUCERS

Dimensions in inches

Nominal Pipe Size (NPS)	Outside Diameter at Bevel D		End-to-End H	Nominal Pipe Size (NPS)	Outside Diameter at Bevel D		End-to-End H
	Large End	Small End			Large End	Small End	
24×22	24.00	22.00	20.00	38×36	38.00	36.00	24.00
24×20	24.00	20.00	20.00	38×34	38.00	34.00	24.00
24×18	24.00	18.00	20.00	38×32	38.00	32.00	24.00
24×16	24.00	16.00	20.00	38×30	38.00	30.00	24.00
26×24	26.00	24.00	24.00	38×28	38.00	28.00	24.00
26×22	26.00	22.00	24.00	38×26	38.00	26.00	24.00
26×20	26.00	20.00	24.00	40×38	40.00	38.00	24.00
26×18	26.00	18.00	24.00	40×36	40.00	36.00	24.00
28×26	28.00	26.00	24.00	40×34	40.00	34.00	24.00
28×24	28.00	24.00	24.00	40×32	40.00	32.00	24.00
28×20	28.00	20.00	24.00	40×30	40.00	30.00	24.00
28×18	28.00	18.00	24.00	42×40	42.00	40.00	24.00
30×28	30.00	28.00	24.00	42×38	42.00	38.00	24.00
30×26	30.00	26.00	24.00	42×36	42.00	36.00	24.00
30×24	30.00	24.00	24.00	42×34	42.00	34.00	24.00
30×20	30.00	20.00	24.00	42×32	42.00	32.00	24.00
32×30	32.00	30.00	24.00	42×30	42.00	30.00	24.00
32×28	32.00	28.00	24.00	44×42	44.00	42.00	24.00
32×26	32.00	26.00	24.00	44×40	44.00	40.00	24.00
32×24	32.00	24.00	24.00	44×38	44.00	38.00	24.00
34×32	34.00	32.00	24.00	44×36	44.00	36.00	24.00
34×30	34.00	30.00	24.00	46×44	46.00	44.00	28.00
34×26	34.00	26.00	24.00	46×42	46.00	42.00	28.00
34×24	34.00	24.00	24.00	46×40	46.00	40.00	28.00
36×34	36.00	34.00	24.00	46×38	46.00	38.00	28.00
36×32	36.00	32.00	24.00	48×46	48.00	46.00	28.00
36×30	36.00	30.00	24.00	48×44	48.00	44.00	28.00
36×26	36.00	26.00	24.00	48×42	48.00	42.00	28.00
36×24	36.00	24.00	24.00	48×40	48.00	40.00	28.00

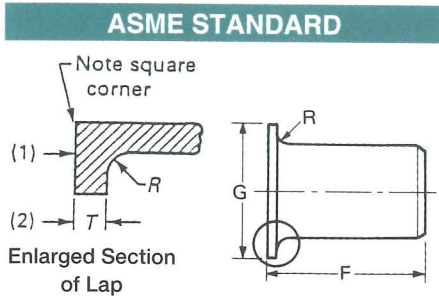
NOTES:

- (1) While the figure illustrates a "bell shaped" reducer, the use of conical reducer is not prohibited.
- (2) Dimensions applicable to the large end in MSS SP-43 are NPS 24 and smaller.
- (3) Dimensions for NPS 22 are not specified in MSS SP-43.
- (4) Dimensions for NPS 1×3/8 are not specified in ASME B16.9.

DIMENSIONS OF LAP-JOINT STUB ENDS

ASME B16.9

Dimensions in inches



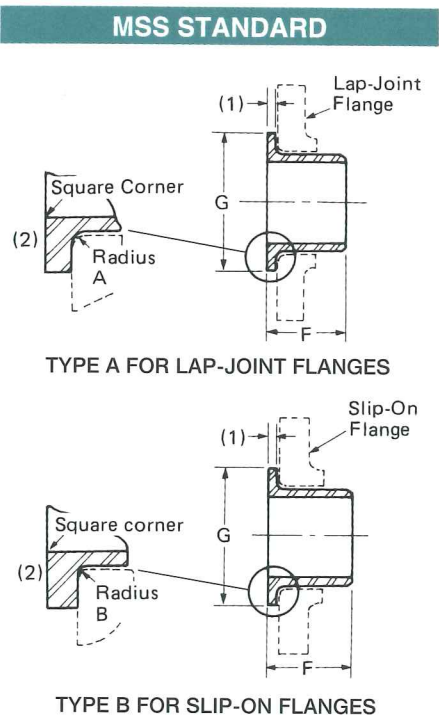
NOTES:

- (1) Gasket face finish shall be in accordance with ASME B16.5 for raised face flanges.
- (2) The lap thickness T shall not be less than nominal pipe wall thickness.
- (3) When short pattern stub ends are used with large flanges in Classes 300 and 600, and with most sizes in Classes 900 and higher, and when long pattern stub ends are used with larger flanges in Classes 1500 and 2500, it may be necessary to increase the length of the stub ends in order to avoid covering the weld with the flange. Such increases in length shall be a matter of agreement between the manufacturer and the purchaser.
- (4) When special facings such as tongue and groove, male and female, etc., are employed, additional lap thickness must be provided and such additional thickness shall be in addition to (not included in) the basic length F.
- (5) These dimensions conform to the radius established for lap joint flanges in ASME B16.5, Pipe Flanges and Flanged Fittings.
- (6) This dimension conforms to standard machine facings shown in ASME B16.5. The back face of the lap shall be machined to conform to the surface on which it seats. Where ring joint facings are to be applied, use dimension K as given in ASME B16.5.

Nominal Pipe Size (NPS)	Outside Diameter of Barrel		Long Pattern Length	Short Pattern Length	Radius of Fillet	Diameter of Lap
	Max.	Min.	F (3), (4)	F (3), (4)	R (5)	G (6)
1/2	0.896	0.809	3.00	2.00	0.12	1.38
3/4	1.106	1.019	3.00	2.00	0.12	1.38
1	1.376	1.284	4.00	2.00	0.12	2.00
1 1/4	1.716	1.629	4.00	2.00	0.19	2.50
1 1/2	1.965	1.896	4.00	2.00	0.25	2.88
2	2.456	2.344	6.00	2.50	0.31	3.62
2 1/2	2.966	2.844	6.00	2.50	0.31	4.12
3	3.596	3.469	6.00	2.50	0.38	5.00
3 1/2	4.096	3.969	6.00	3.00	0.38	5.50
4	4.593	4.469	6.00	3.00	0.44	5.19
5	5.683	5.532	8.00	3.00	0.44	7.31
6	6.743	6.594	8.00	3.50	0.50	8.50
8	8.743	8.594	8.00	4.00	0.50	10.62
10	10.913	10.719	10.00	5.00	0.50	12.75
12	12.913	12.719	10.00	6.00	0.50	15.00
14	14.170	13.969	12.00	6.00	0.50	16.25
16	16.180	15.969	12.00	6.00	0.50	18.50
18	18.190	17.969	12.00	6.00	0.50	21.00
20	20.240	19.969	12.00	6.00	0.50	23.00
22	22.240	21.969	12.00	6.00	0.50	25.25
24	24.240	23.969	12.00	6.00	0.50	27.25

MSS SP-43

Dimensions in inches



TYPE A FOR LAP-JOINT FLANGES

TYPE B FOR SLIP-ON FLANGES

NOTES:

- (1) Minimum lap thickness shall not be less than nominal wall thickness.
- (2) Contact faces of stub ends shall have a modified spiral or concentric serration.
- (3) These lengths and radii for use with Schedule 40S or thinner pipe.

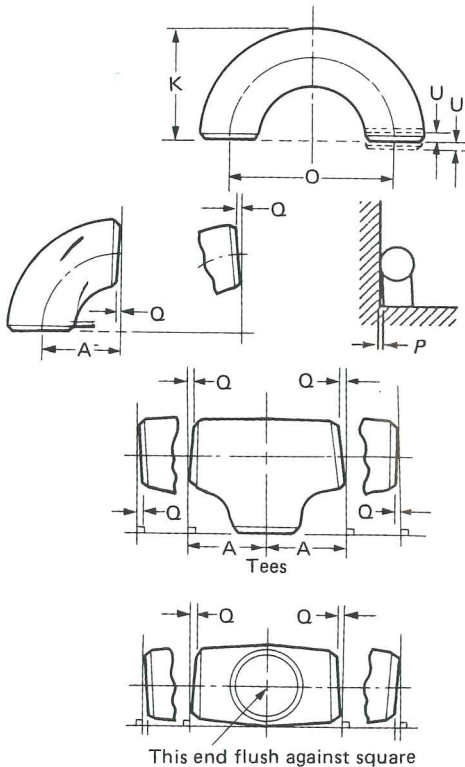
Nominal Pipe Size (NPS)	Nominal O.D. at Bevel	Lap-Joint Stub Ends (3)			
		Length F	Dia. of Lap Nominal & Maximum G	Radius of Fillet	
				Nominal & Max. A	Max. B
1/2	0.84	2.00	1.38	0.12	0.03
3/4	1.05	2.00	1.69	0.12	0.03
1	1.32	2.00	2.00	0.12	0.03
1 1/4	1.66	2.00	2.50	0.19	0.03
1 1/2	1.90	2.00	2.88	0.25	0.03
2	2.38	2.50	3.62	0.31	0.03
2 1/2	2.88	2.50	4.12	0.31	0.03
3	3.50	2.50	5.00	0.38	0.03
3 1/2	4.00	3.00	5.50	0.38	0.03
4	4.50	3.00	6.19	0.44	0.03
5	5.56	3.00	7.31	0.44	0.06
6	6.62	3.50	8.50	0.50	0.06
8	8.62	4.00	10.62	0.50	0.06
10	10.75	5.00	12.75	0.50	0.06
12	12.75	6.00	15.00	0.50	0.06
14	14.00	6.00	16.25	0.50	0.06
16	16.00	6.00	18.50	0.50	0.06
18	18.00	6.00	21.00	0.50	0.06
20	20.00	6.00	23.00	0.50	0.06
24	24.00	6.00	27.25	0.50	0.06

DIMENSIONAL TOLERANCES

ASME B16.9 • ASME B16.28 • MSS SP-43

Dimensions in inches

Nominal Pipe Size (NPS)	All Fittings		Inside Diameter at End (1), (2)	Wall Thickness t	90° Elbows 45° Elbows Tees	Reducers Lap Joint Stub Ends	Cap	180° Returns		
	Outside Diameter at Bevel (1)				Center-to-End Dimension	Overall Length	Overall Length	Center-to-Center Dimension	Back-to-Face Dimension	Alignment of Ends
	ASME	MSS			A, B, C, M	F, H	E	O	K	U
1/2 to 2 1/2	+0.06 -0.03	±0.03	±0.03	Not less than 87.5% of nominal thick- ness	±0.06	±0.06	±0.12	±0.25	±0.25	±0.03
3 to 3 1/2	±0.06	±0.03	±0.06		±0.06	±0.06	±0.12	±0.25	±0.25	±0.03
4	±0.06	±0.03	±0.06		±0.06	±0.06	±0.12	±0.25	±0.25	±0.03
5 to 8	+0.09 -0.06	+0.06 -0.03	±0.06		±0.06	±0.06	±0.25	±0.25	±0.25	±0.03
10 to 18	+0.16 -0.12	+0.09 -0.03	±0.12		±0.09	±0.09	±0.25	±0.38	±0.25	±0.06
20 to 24	+0.25 -0.19	+0.12 -0.03	±0.19		±0.09	±0.09	±0.25	±0.38	±0.25	±0.06
26 to 30	+0.25 -0.19	...	±0.19		±0.12	±0.19	±0.38	...	...	...
32 to 48	+0.25 -0.19	...	±0.19	±0.19	±0.19	±0.38	...	...	...



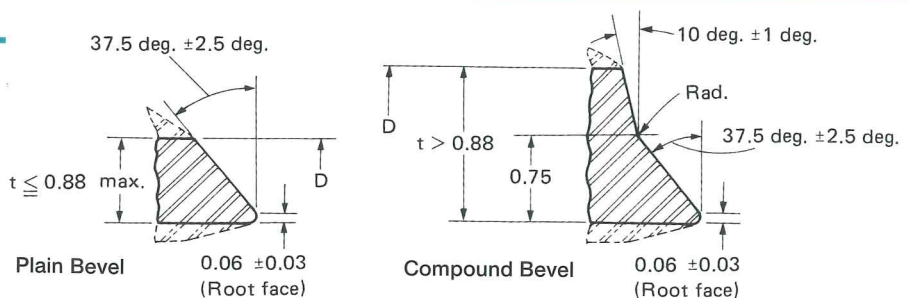
Nominal Pipe Size (NPS)	Angularity Tolerances	
	Off Angle	Off Plane
	Q	P
1/2 to 4	±0.03	±0.06
5 to 8	±0.06	±0.12
10 to 12	±0.09	±0.19
14 to 16	±0.09	±0.25
18 to 24	±0.12	±0.38
26 to 30	±0.19	±0.38
32 to 42	±0.19	±0.50
44 to 48	±0.19	±0.75

Nominal Pipe Size (NPS)	Lap Joint Stub Ends				
	Outside Diameter of Lap		Fillet Radius of Lap		Lap Thickness
	ASME	MSS	ASME	MSS	
	G	R	A	T	
1/2 to 2 1/2	+0	+0 -0.03	+0	+0 -0.03	+0.06 -0
3 to 3 1/2	+0 -0.03	+0 -0.03	+0 -0.03	+0 -0.03	+0.06 -0
4	+0 -0.03	+0 -0.03	+0 -0.06	+0 -0.06	+0.06 -0
5 to 8	+0 -0.03	+0 -0.03	+0 -0.06	+0 -0.06	+0.06 -0
10 to 18	+0 -0.06	+0 -0.06	+0 -0.06	+0 -0.06	+0.12 -0
20 to 24	+0 -0.06	+0 -0.06	+0 -0.06	+0 -0.06	+0.12 -0

NOTES:

- (1) Out-of-round is the sum of absolute values of plus and minus tolerance.
- (2) Unless otherwise specified, these tolerances apply to the nominal inside diameter, which equals the difference between the nominal outside diameter and twice the nominal wall thickness.
- (3) The standard ASME B16.28 covers nominal pipe sizes 1/2 through 24.
- (4) The standard MSS SP-43 covers nominal pipe sizes 1/2 through 24.

WELDING BEVEL



CORPORATE PROFILE

Firm Name:

MIE TECHNO CO., LTD.

Management:

MASAYUKI MIZUGUCHI (President)

Head Office & Factory:

1001, Hoshikawa, Kuwana City, Mie Pref. 511-0912

Branch & Offices:

Tokyo, Osaka

Foundation:

June 8, 1907

Capital paid up:

556.5 Million Yen

Number of Employees:

164 (Male : 115, Female : 49)

Main Products

● Stainless Steel Butt-Welding Fittings

Large-sized pipe fittings

Small-sized pipe fittings

● Titanium, Aluminium Alloy Steel Butt-Welding Fittings

● Stainless Steel Indoor Pipe Fittings

Utility Service Fittings (MIE-GRIP)

Calking tools and pipe cutters

Stainless steel butt-welding pipe fittings for Building Prefabrication pipes

● Stainless Steel Flanges

● Screwed Type Stainless Steel Pipe Fittings

Outline of Corporate History:

- 1907** Founded under the firm name of HORO TEKKI COMPANY LIMITED.
- 1912** Designated as one of naval service kitchenware (bowls) suppliers.
- 1912** The company was the first to export enameled ironware from Japan to China. Enlarged the market to Southeast Asia and Africa. Winning fame, the EAGLE brand products of the company advanced into the American market, too.
- 1922** Changed the firm name to MIE HORO COMPANY LIMITED. Through enlargement of production facilities, the company supplied military circles with steel helmets, canteens, aircraft parts, vehicle parts and other munitions serving the wartime industry since the Manchurian Incident till the midst of the World War II.
- 1945** Major parts of the factory were air-raided and burnt down. But the company started reconstruction promptly after the war.
- 1961** Listed in the Nagoya Stock Market.
- 1963** Construction work started for a new factory at Hoshikawa, Kuwana City.
- 1964** Upon completion of the new factory, the company set about production of stainless steel pipe fittings and mechanical parts, and succeeded in expansion of the market.
- 1978** Capitalized at 556.5 Million Yen.
- 2001** Changed the firm name to MIE TECHNO CO., LTD.

Main Production Facilities and Machinery:

- Site (Head Office & Factory)45,010m²
- Floor space (Head Office & Factory)21,004m²
- Machinery:
 - Press Machine57 sets
 - Plate Working Machine18 sets
 - Machine Tool.....76 sets
 - Welding Machine64 sets
 - Pneumatic Pressure Equipment18 sets
 - Surface Treatment Equipment1 unit
 - Heat Treatment Equipment.....5 sets
 - Enameling Furnace Equipment1 unit
 - Inspection Equipment1 unit (Radiographic Equipment)

QUALIFICATIONS

- JIS B2312 Steel Butt-Weld type Pipe Fittings
- JIS B2313 Steel Plate Butt-Weld type Fittings
- JIS display authorized (License No.475057)
- Manufacture of Grip Type Pipe Fittings recognized by the Ministry of Construction
- General Construction and Metal Works approved by the Mie Prefectural Authorities (General Construction Work Category 5 No.18037)
- Waterworks inspecting station registered by the Japanese Waterworks Association (Reg. No.D-67)
- Water Supply Fittings (models) approved by the Japanese Waterworks Association.
- Stainless Steel pipe fittings for general piping conforming to Stainless Steel Association Standard SAS 322 recognized Grip Type Pipe Fittings (MIE GRIP) Approval No.32205
- Welding procedure under the Gas Industry Law; Approval No.57, Resource Agency Ref. No.12130
- Welding procedure under the Electrical Industry Law; Approval No.57, Resource Agency Ref. No.4559
- Stainless steel plate butt-welding procedure approved by the Japan Maritime Corporation (NKK); Approval No.81NG1958
- Stainless steel plate butt-welding procedure approved by the Japan Maritime Corporation (NKK); Approval No.92NG828
- Pipe fittings witness inspection exempted by the Japan Maritime Corporation (NKK); Approval No.93NG457
- Austenite stainless steel weld type pipe fittings approved by Det Norske Veritas, Norway; Approval No.TP255/SOLL/KiH
- Stainless steel plate and pipe welding procedure approved by ABS Pacific, USA
- Stainless steel plate and pipe fittings butt-welding procedure approved by Lloid's Register of Shipping
- Class 1 pressure vessel manufacture approved
- Registered by ISO 9001; Certificate No.JQA-1899
- Registered by ISO 14001; Certificate No.JQA-EM0641





MIE TECHNO CO.,LTD.

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Tokyo Branch Office:

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Tel: (03) 3646-0221 Fax: (03) 3646-0226

Osaka Branch Office:

801 8th Floor City Bldg., Awaza,
4-5-27, itachibori, Nishi-ku, Osaka, 550-0012
Tel: (06) 6536-1995 Fax: (06) 6536-2955

