

ANSI/ASME BUTTWELD FITTINGS DIMENSIONS

American Buttweld Fittings – General

This subsection summarises buttweld fitting dimensions and tolerances as defined in the relevant ASME/ANSI and MSS specifications. Wall thicknesses and weights are not defined in these specifications since the fittings must comply with the wall thicknesses of the pipes with which they are used. Dimensional tolerances, including cross sectional tolerances, are defined however, and are reproduced in the following pages.

Applicable Specifications

Specifications applicable to buttwelding fittings are as follows:

- **ASME/ANSI B16.9-1993** - Factory-made wrought steel buttwelding fittings.
- **ASME/ANSI B16.28-1994** - Wrought steel buttwelding short radius elbows and returns.
- **MSS SP-43 1991, Reaffirmed 1996** - Wrought stainless steel buttwelding fittings. This applies to 5S, 10S, and 40S wall thicknesses only.
- **ASME/ANSI B16.25-1992** - Buttwelding ends. This defines various weld bevel designs and dimensions, beyond the scope of this manual.
- **Wall Thicknesses.** Fittings are manufactured to match the wall thicknesses of pipe (see page 6-6).
- **Weights** quoted in the fitting tables are based on manufacturers' data and are approximate. Actual weights may vary from those quoted depending on the type of construction. For austenitic and duplex stainless steel, multiply the quoted weight by 1.014. For ferritic and martensitic stainless steel, multiply the quoted weight by 0.985.

Dimensions and Tolerances - ASME/ANSI B16.9

Dimensions of butt-welding fittings:

Long Radius Elbows

Nominal Pipe Size (inches)	Outside Pipe Diameter (inches)	Distance Center to End (inches)	
		90° Elbows	45° Elbows
1	1.315	1 1/2	7/8
1 1/4	1.660	1 7/8	1

Nominal Pipe Size (inches)	Outside Pipe Diameter (inches)	Distance Center to End (inches)	
		90° Elbows	45° Elbows
1 1/2	1.900	2 1/4	1 1/8
2	2.375	3	1 3/8
2 1/2	2.875	3 3/4	1 3/4
3	3.5	4 1/2	2
3 1/2	4.0	5 1/4	2 1/4
4	4.5	6	2 1/2
5	5.563	7 1/2	3 1/8
6	6.625	9	3 3/4
8	8.625	12	5
10	10.750	15	6 1/4

180° Returns

Nominal Pipe Size (inches)	Outside Pipe Diameter (inches)	Distance (inches)	
		Center to Center	Back to Face
1	1.315	3	2 3/16
1 1/4	1.660	3 3/4	2 3/4
1 1/2	1.900	4 1/2	3 1/4
2	2.375	6	4 3/16
2 1/2	2.875	7 1/2	5 3/16
3	3.5	9	6 1/4

Nominal Pipe Size (inches)	Outside Pipe Diameter (inches)	Distance (inches)	
		Center to Center	Back to Face
3 1/2	4.0	10 1/2	7 1/4
4	4.5	12	8 1/4
5	5.563	15	10 5/16
6	6.625	18	12 5/16
8	8.625	24	16 5/16
10	10.750	30	20 3/8

Straight Tees

Nominal Pipe Size (inches)	Outside Pipe Diameter (inches)	Distance Center to End (inches)	
		Run	Outlet
1	1.315	1 1/2	1 1/2
1 1/4	1.660	1 7/8	1 7/8
1 1/2	1.900	2 1/4	2 1/4
2	2.375	2 1/2	2 1/2
2 1/2	2.875	3	3
3	3.5	3 3/8	3 3/8
3 1/2	4.0	3 3/4	3 3/4
4	4.5	4 1/8	4 1/8
5	5.563	4 7/8	4 7/8
6	6.625	5 5/8	5 5/8

Nominal Pipe Size (<i>inches</i>)	Outside Pipe Diameter (<i>inches</i>)	Distance Center to End (<i>inches</i>)	
		Run	Outlet
8	8.625	7	7
10	10.750	8 1/2	8 1/2