

Stainless Steel Butt Weld Fittings Guide

1. What are Butt Weld Fittings?

- ◆ Butt Weld Fittings are a family of fittings used in connecting and creating pipe-work systems whereby they are welded into the system using circumferential butt welds.
- ◆ They are used only in conjunction with ANSI Pipe and are available in the same size range.
- ◆ They are used in areas where pipe-work is permanent and are designed to provide good flow characteristics.

2. What manufacturing standard is required and is the fitting seamless or welded?

Wrought pipe fittings are manufactured to dimensions and tolerances in ANSI B16.9 with the exception of short radius elbows and return bends which are made to ANSI B16.28. Light-weight corrosion resistant fittings are made to MSS SP43.

Butt Weld Fittings are available to ASTM A403, ASTM A815 and MSS SP43. These standards require the fittings to be manufactured as follows:

- ◆ Seamless austenitic fittings are made from seamless pipe to ASTM A312.
- ◆ Welded fittings in austenitic grades are manufactured from welded pipe to ASTM A312 or plate to ASTM A240. Note that welded fittings manufactured from plate may have two welds.
- ◆ Duplex (ferritic/austenitic) grades are manufactured from pipe to ASTM A790 or plate to ASTM A240.

ASTM A403/A815 Butt Weld Fittings are subdivided into four classes:

- ◆ **WP-S:** Made from seamless pipe to ASTM A312 (Austenitic) or ASTM A790 (Duplex).
- ◆ **WP-W:** Manufactured from welded pipe to ASTM A312 (Austenitic) or ASTM A790 (Duplex). There is no requirement for radiography unless a manufacturer's weld has been introduced or there are welds made with the addition of filler metal.

WP-WX: Of welded construction. All welds must be 100% radiographed in accordance with Paragraph UW-51 of Section VIII, Division 1 of the ASME Boiler and Pressure Vessel Code.

- ◆ **WP-WU:** Of welded construction. All welds must be 100% examined ultrasonically in accordance with Paragraph UW-51 of Section VIII, Division 1 of the ASME Boiler and Pressure Vessel Code. Note that this Class only applies to austenitic fittings made to ASTM A403.

CR Fittings are manufactured to the requirements of MSS SP43. These are light-weight fittings and do not require radiography.

Notes:

- ◆ WP: Means Wrought Pipe
- ◆ CR: Means Corrosion Resistant

3. What grades are available?

Types 304L and 316L are readily available from stock in a large range of pipe sizes and wall thicknesses up to about 12 inch Nominal Bore. A wide range of other sizes and grades including duplex types and nickel alloys are manufactured to order.

4. What markings will be on the fittings?

The full identification of the fitting should be marked on it including:

- ◆ Nominal Pipe Size (Nominal Bore)
- ◆ Schedule (Wall Thickness)
- ◆ Specification
- ◆ Grade
- ◆ Method of Manufacture (Seamless or Welded)
- ◆ Heat Number
- ◆ Manufacturer's Name or Symbol



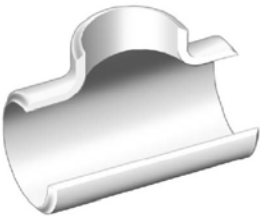
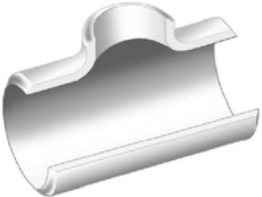



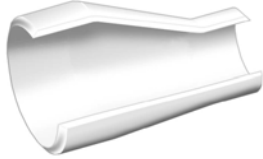

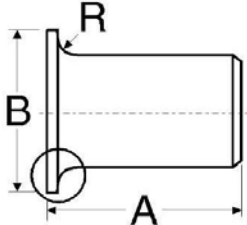
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5. For what is each fitting used?

Fitting	Use / Notes
Long Radius Elbows: 45 & 90 Degree Elbows and 180 Degree Return Bends	
	Enables the pipe run to be turned through 45 degrees, a right angle or back on itself. Radius is 1.5 times nominal pipe size.
90 Degree Short Radius Elbows and 180 Degree Return Bends	
	Enables the pipe run to be turned through a right angle or back on itself. Radius is the same as the nominal pipe size.
Equal Tee	
	Allows connection of a branch at right angles from main pipe run. Branch has same dimensions as main pipe run.
Reducing Tee	
	Allows connection of a branch at right angles from main pipe run. Branch has smaller dimensions than main pipe run. When stating the size, <u>the larger dimension always specifies the main pipe run</u> , no matter which order the dimensions are quoted in.

Concentric Reducer	
	Used to connect two pipes of different dimensions. Designed to have good flow characteristics thus reducing erosion and corrosion.
Eccentric Reducer	
	Used to connect two pipes of different sizes. Has one straight side allowing pipe run to stay flat against a wall and may be preferred for some flows.
End Cap	
	Used to blank off at the end of pipe-work.
Stub End NB: Made to MSS SP43	
	Always used with a Lap Joint Flange as a backing flange. Flange can be made of coated mild steel as it does not come into contact with the product in the pipe. This is a cheap method of flanging in low-pressure, non critical applications.

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