

Welding Symbol Basics

Here's some rights, wrongs, and insights regarding the fillet welding symbol

BY J. P. CHRISTEIN AND PAMELA COATES

Welding symbols provide a system for placing welding information on drawings and work sites for the purpose of relaying information to fitters, welders, fabricators, inspectors, etc. These symbols quickly indicate the type of weld joint needed to satisfy the requirements for the intended service conditions.

There are a number of standards throughout the world that relate to weld symbols, but in the United States, AWS A2.4, *Standard Symbols for Welding, Brazing, and Nondestructive Examination*, is the standard.

To start, the terms weld symbol and welding symbol have important meanings in the AWS system. The weld symbol identifies the specific type of weld (e.g., fillet, groove, plug, slot, etc.). The welding symbol is the weld symbol with all the additional element information (e.g., size, pitch, length, etc.) applied to it.

Even though a welding symbol may consist of several elements, only the reference line and an arrow are required ele-

ments — Fig. 1. The reference line is always drawn horizontally. The arrow connects the reference line to the arrow side member of the weld joint. The arrow may or may not be broken to indicate weld locations.

The Fillet Welding Symbol

The fillet weld symbol is probably the most recognized. The symbol represents a miniature detail of the weld. The fillet symbol is drawn on the reference line with the perpendicular leg always to the left — Fig. 2. Figures 3 and 4 are examples of the fillet weld symbol incorrectly specified.

The location of the fillet weld(s) is designated by the arrow. The arrow is used to point to a line, location, or area that conclusively identifies the joint, location, or area to be welded. Fillet welds on the arrow side of the joint (regardless of which end the arrow connects to the reference line) is specified by placing the

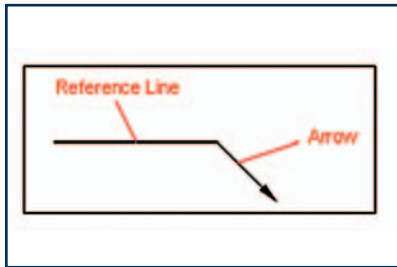


Fig. 1 — Reference line and arrow.

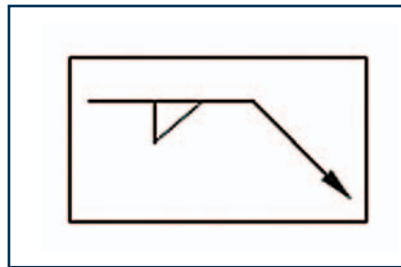


Fig. 2 — Fillet weld symbol correctly illustrated.

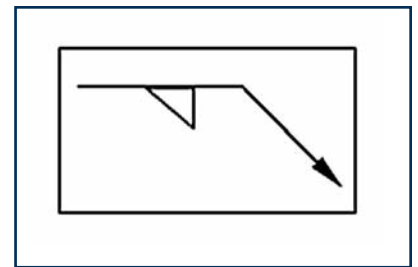


Fig. 3 — Fillet weld symbol incorrectly drawn backward.

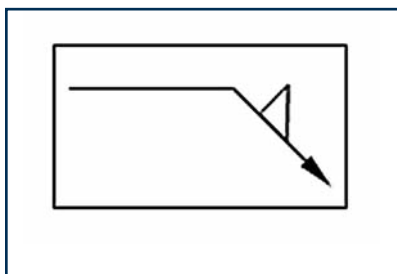


Fig. 4 — Fillet weld symbol incorrectly drawn on the arrow.

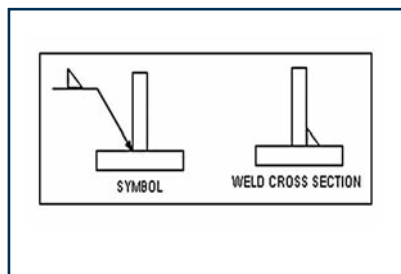


Fig. 5 — Fillet weld symbol illustrating welding the other side of the joint.

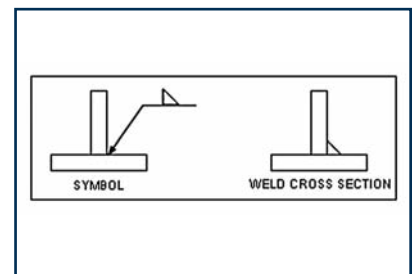


Fig. 6 — Fillet weld symbol incorrectly illustrating arrow side.

J.P. CHRISTEIN (J.Christein@ngc.com) is a structural engineer with more than 29 years of experience for Northrop Grumman Shipbuilding – Newport News. He is chair of the AWS A2C Subcommittee on Symbols and has been a member of the committee for more than 15 years.

PAMELA COATES is a structural designer with more than six years of experience for Northrop Grumman Shipbuilding – Newport News. She is also a civil engineering student at Old Dominion University.

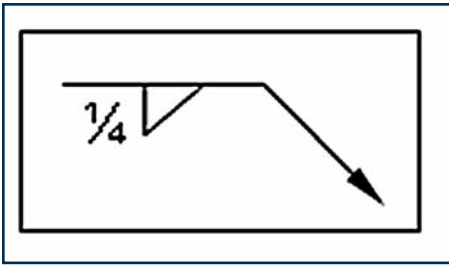


Fig. 7 — Size of the fillet weld located correctly on same side of reference line as symbol.

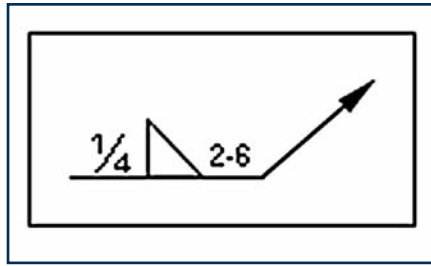


Fig. 8 — Size, length, and pitch of fillet weld located correctly on same side of reference line as symbol.

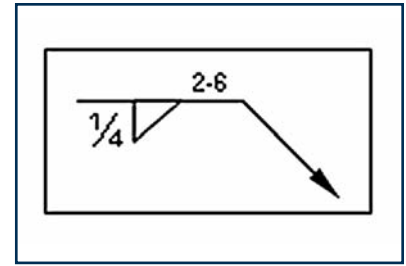


Fig. 9 — Length and pitch incorrectly shown on opposite side of reference line from symbol.

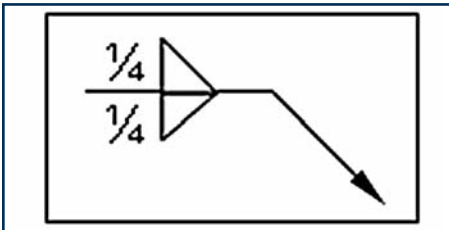


Fig. 10 — Size placement of an identical double fillet weld.

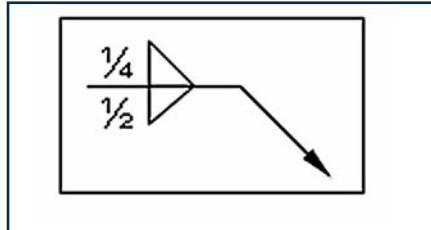


Fig. 11 — Size placement of different fillet welds.

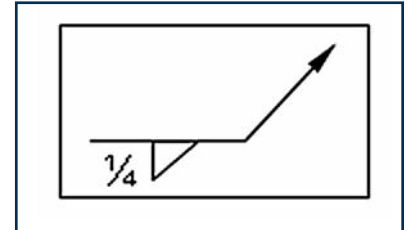


Fig. 12 — Fillet weld size shown correctly to the left of the symbol.

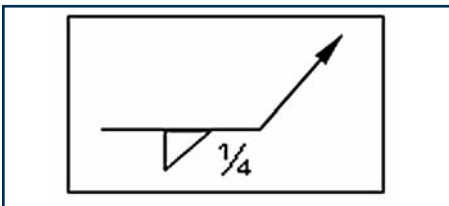


Fig. 13 — Fillet weld size specified incorrectly to the right of the symbol.

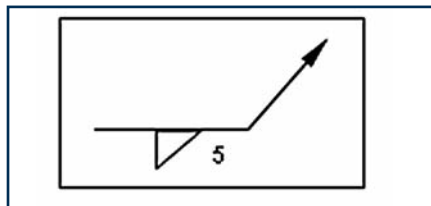


Fig. 14 — The length of the fillet weld specified correctly.

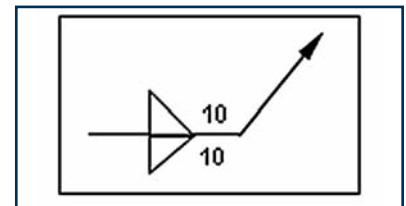


Fig. 15 — The length of a double fillet weld specified correctly.

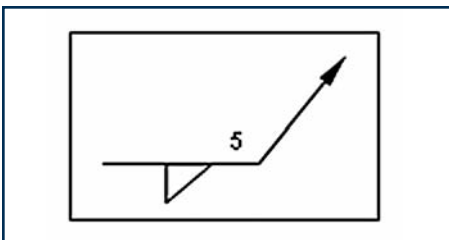


Fig. 16 — The length of a fillet incorrectly shown on opposite side of reference line.

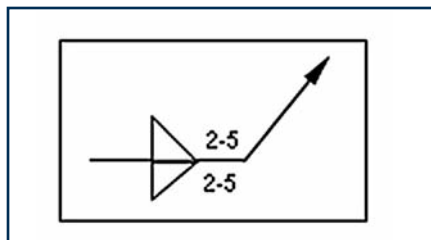


Fig. 17 — Chain intermittent fillet welding symbol designating length and pitch.

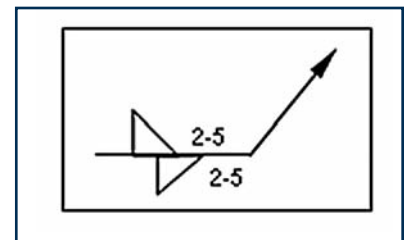


Fig. 18 — Staggered intermittent fillet welding symbol designating length and pitch.

fillet weld symbol below the reference line. A fillet weld on the other side of the joint is specified by placing the fillet weld symbol above the reference line — Fig. 5. Figure 6 is an example of a fillet weld symbol incorrectly specified.

The standard dimensions of the fillet weld are size, length, and pitch. Dimensions are required to be on the same side of the reference line as the fillet weld symbol — Figs. 7, 8. Figure 9 is an example of a dimension incorrectly specified.

The dimensions of double fillet welds are placed on both sides of the reference line whether the dimensions are identical or different — Figs. 10, 11.

Figure 10 is one example where placing the dimension (size, length, and pitch) for an identical double fillet weld on both sides of the reference line might not be done in practice to the AWS A2.4 requirement. In some cases, identical dimension information might only be on one side of the reference line. There could be a contract agreement or a drawing note in place allowing this deviation. In other cases, the single dimension

might be from the use of an older drawing. Care must be taken before making any judgments on any identical double fillet weld symbols.

The size of the fillet weld is specified to the left of the fillet weld symbol — Fig. 12. Figure 13 is an example of the fillet weld size being incorrectly specified in the area that designates length.

The length of the fillet weld when used is specified to the right of the weld symbol — Figs. 14, 15. Figure 16 is an example of a fillet weld being incorrectly identified. If the length dimension is not used, the fillet weld will extend the full length of the weld joint.

If the fillet weld is not continuous, but a constant intermittent length is needed, then the pitch dimension is used. The pitch dimension (center-to-center spacing of welds) is placed to the right of the length dimension and separated by a hyphen. There are two types of intermittent fillet welds, chain and staggered. The chain intermittent fillet weld dimensions are placed on both sides of the reference line and opposite to each other — Fig. 17.

The staggered intermittent fillet weld dimensions are placed

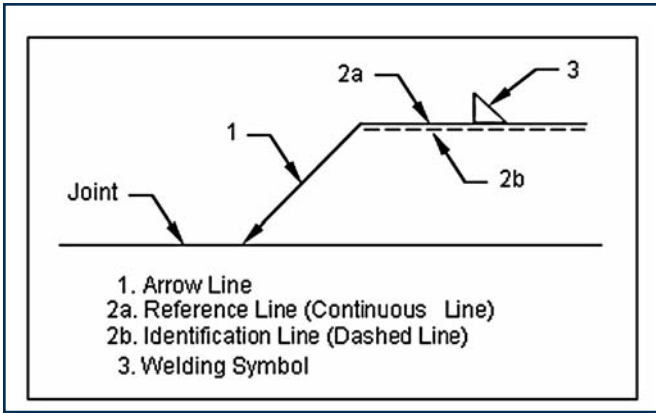


Fig. 19 — ISO welding symbol system.

on both sides of the reference line but are not opposite each other. The length and pitch are spaced symmetrically in relationship to the fillet weld symbol — Fig. 18.

ISO Welding System

In the global marketplace, the International Organization for Standardization (ISO) has developed ISO 2553:1992, *Welded, Brazed, and Soldered Joints — Symbolic Representation on Drawings*. The weld symbols in this standard are very similar to AWS A2.4, but there are differences that can cause interpretation difficulties or the incorrect usage of welding symbols for the unacquainted user.

The ISO system (Fig. 19) uses the same reference line and

Desired Weld	ISO 2553	AWS A2.4


Fig. 20 — Comparison of ISO and AWS fillet welding symbols.


arrow system. In addition, the ISO system uses a dashed identification line that is not utilized by AWS.

The dashed identification line is used to indicate the other side of the joint. Information applicable to the arrow side of a joint is placed on the solid reference line. Information applicable to the other side of a joint is placed on the dashed identification line. A word of caution: The dashed identification line may be drawn above or below the solid reference line; a symbol placed on the solid reference line is always applicable to the arrow side of the joint and a symbol on the dashed identification line is always applicable to the other side of the joint, regardless of whether the dashed identification line is placed above or below the solid reference line. Figure 20 demonstrates some typical examples to highlight differences between AWS and ISO symbols. ❖

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