

<b>Welds</b>	<b>Published Date: 11/05/2009</b>
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Welds are typically used to fabricate fixing inserts, lifting brackets and many other components.

**Stainless steel:**

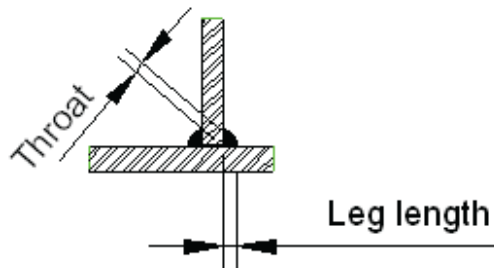
Welds should be carried out in accordance with BS EN 1011-3:2000 'Welding: Recommendations for welding of metallic materials. Arc welding of stainless steels'. Electrodes should be appropriate for the parent steel strength.

**Non-stainless steel:**

Welds should be carried out in accordance with BS EN 1011-1:1998 'Welding. Recommendations for welding of metallic materials. General guidance for arc welding'

Electrodes should comply with BS EN 2560:2005 'Welding consumables. Covered electrodes for the manual metal-arc welding of non-alloy and fine-grained steels. Classification'.

It is essential that welds are made using correct procedures, correct consumables, and only by suitably qualified welders.



The most common weld type is a fillet weld. This is a section run into the corner formed by the two pieces to be joined. Other types sometimes used include butt welds, where the weld fills the space between the pieces to be joined. The weld size is specified as the leg length (see above). If the weld is within an angle of less than 60°, the weld should be treated as a partial penetration butt weld for design purposes. For angles greater than 120°, fillet welds should not be relied on to carry loads. Fillet welds should not be used where there is a bending moment about the longitudinal axis of the weld that causes tension in the root of the weld. The length of a fillet weld is taken as the overall length of full size fillet. However, welds with effective length less than 40mm, or six times the throat thickness should not be relied on to carry loads.

Weld material is normally presumed to have the same strength as the weaker of the pieces to be joined. Under normal circumstances, dissimilar materials should not be welded together. As a 'fail-safe', weld design is often based on the 'rule-of-thumb' that the total throat of weld is at least equal to the area of the thickness of the smaller piece to be joined. Thus the weld would not be critical. However, for most designs a design will be carried out to refine this and give a more economical weld size.

<b>Capacities of fillet welds in steel grade S275</b>								
<b>Leg length (mm)</b>	3	4	5	6	8	10	12	15
<b>Throat thickness (mm)</b>	2.1	2.8	3.5	4.2	5.6	7.0	8.4	10.5
<b>Capacity (kN/mm)</b>	0.462	0.616	0.770	0.924	1.232	1.540	1.848	2.310