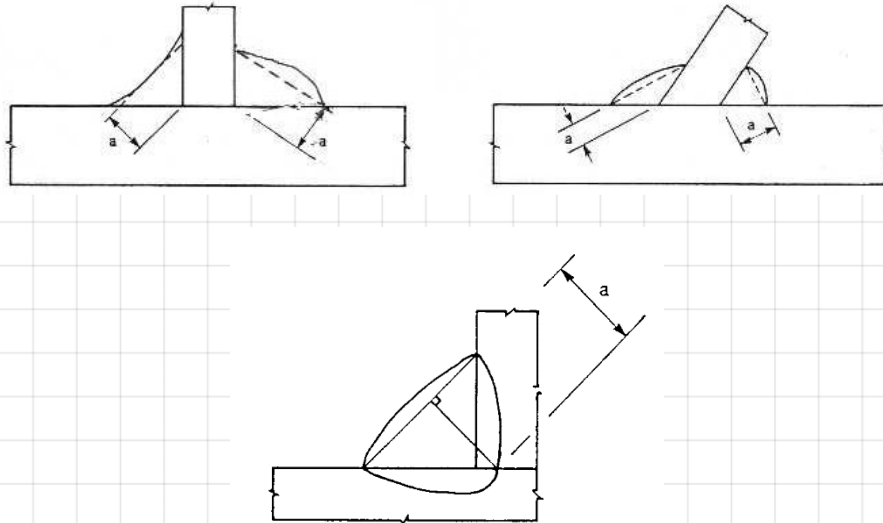


As you may have noticed and according to available statistics, almost 80% of welded joints are made by fillet welding. Because of the importance of this type of weld, we decided to record a playlist regarding the design of fillet welds according to Eurocode. In this video, different basic concepts like effective throat thickness are explained as an introduction to the topic.



4 Welded connections

4.1 General

- (1) The provisions in this section apply to weldable structural steels conforming to EN 1993-1-1 and to material thicknesses of 4 mm and over. The provisions also apply to joints in which the mechanical properties of the weld metal are compatible with those of the parent metal, see 4.2.

For welds in thinner material reference should be made to EN 1993 part 1.3 and for welds in structural hollow sections in material thicknesses of 2,5 mm and over guidance is given section 7 of this Standard.

For stud welding reference should be made to EN 1994-1-1.

NOTE: Further guidance on stud welding can be found in EN ISO 14555 and EN ISO 13918.

- (2) Welds subject to fatigue should also satisfy the principles given in EN 1993-1-9.
- (3) Quality level C according to EN ISO 25817 is usually required, if not otherwise specified. The frequency of inspection of welds should be specified in accordance with the rules in 1.2.7 Reference Standards: Group 7. The quality level of welds should be chosen according to EN ISO 25817. For the quality level of welds used in fatigue loaded structures, see EN 1993-1-9.
- (4) Lamellar tearing should be avoided.
- (5) Guidance on lamellar tearing is given in EN 1993-1-10.

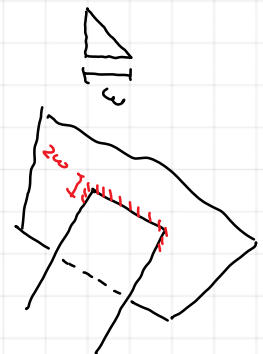
4.3.2 Fillet welds

4.3.2.1 General

- (1) Fillet welds may be used for connecting parts where the fusion faces form an angle of between 60° and 120° .
- (2) Angles smaller than 60° are also permitted. However, in such cases the weld should be considered to be a partial penetration butt weld.
- (3) For angles greater than 120° the resistance of fillet welds should be determined by testing in accordance with EN 1990 Annex D: Design by testing.
- (4) Fillet welds finishing at the ends or sides of parts should be returned continuously, full size, around the corner for a distance of at least twice the leg length of the weld, unless access or the configuration of the joint renders this impracticable.

NOTE: In the case of intermittent welds this rule applies only to the last intermittent fillet weld at corners.

- (5) End returns should be indicated on the drawings.
- (6) For eccentricity of single-sided fillet welds, see 4.12.



4.5 Design resistance of a fillet weld

4.5.1 Length of welds

- (1) The effective length of a fillet weld l should be taken as the length over which the fillet is full-size. This may be taken as the overall length of the weld reduced by twice the effective throat thickness a . Provided that the weld is full size throughout its length including starts and terminations, no reduction in effective length need be made for either the start or the termination of the weld.
- (2) A fillet weld with an effective length less than 30 mm or less than 6 times its throat thickness, whichever is larger, should not be designed to carry load.

4.5.2 Effective throat thickness

- (1) The effective throat thickness, a , of a fillet weld should be taken as the height of the largest triangle (with equal or unequal legs) that can be inscribed within the fusion faces and the weld surface, measured perpendicular to the outer side of this triangle, see Figure 4.3.

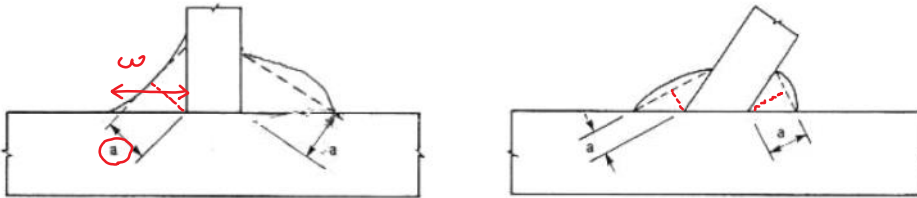


Figure 4.3: Throat thickness of a fillet weld

4.5.3 Design Resistance of fillet welds

4.5.3.1 General

- (1) The design resistance of a fillet weld should be determined using either the Directional method given in 4.5.3.2 or the Simplified method given in 4.5.3.3.