



Welding Inspection Symbols

Course Reference WIS 5

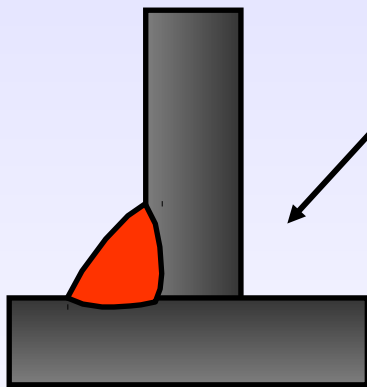
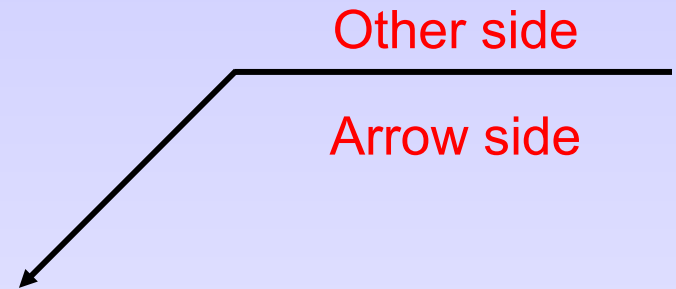
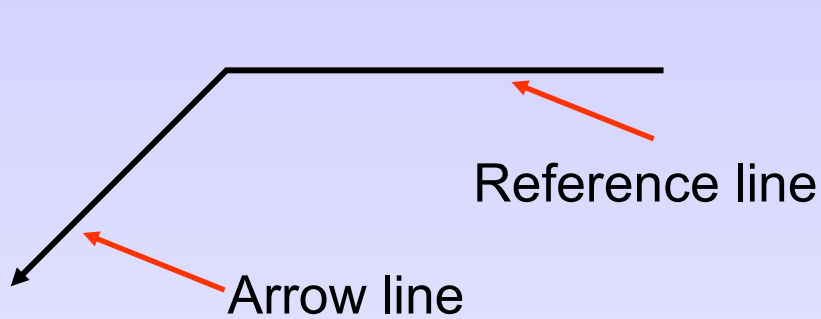
BS 499 part 2 Welding Symbols

Welding Symbols

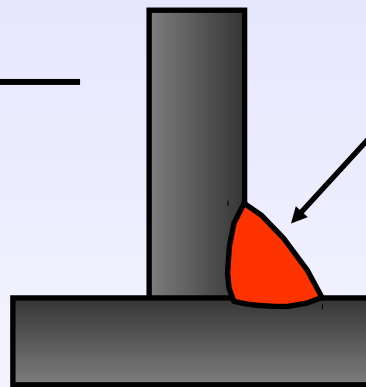
Weld symbols are used to transfer information from the design office to the workshop and contain five basic components

- **The arrow line:** the arrow line must touch the joint reference area on the drawing
- **The reference line:** the reference line must touch the arrow line and is generally parallel with the bottom of the drawing page
- **The symbol:** the vertical line in the symbols for a fillet weld, single/double bevel butts and a J-butt welds must always be on the left side.
- **The dimensions:** In most standards the cross sectional dimensions are given to the left side, and all linear dimensions are given on the right side
- **Supplementary information:** such as welding process, weld profile, NDT and any special instructions

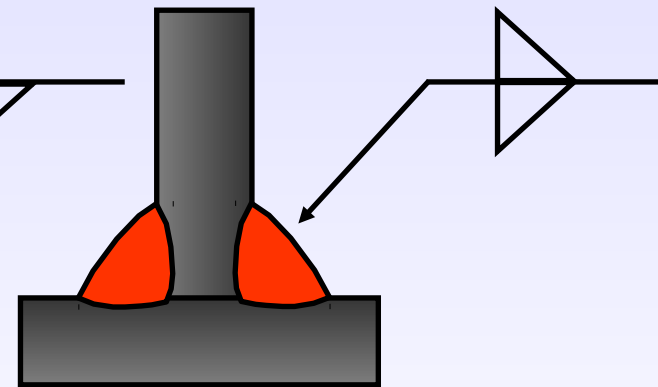
BS 499: part 2. Welding Symbols



Other side

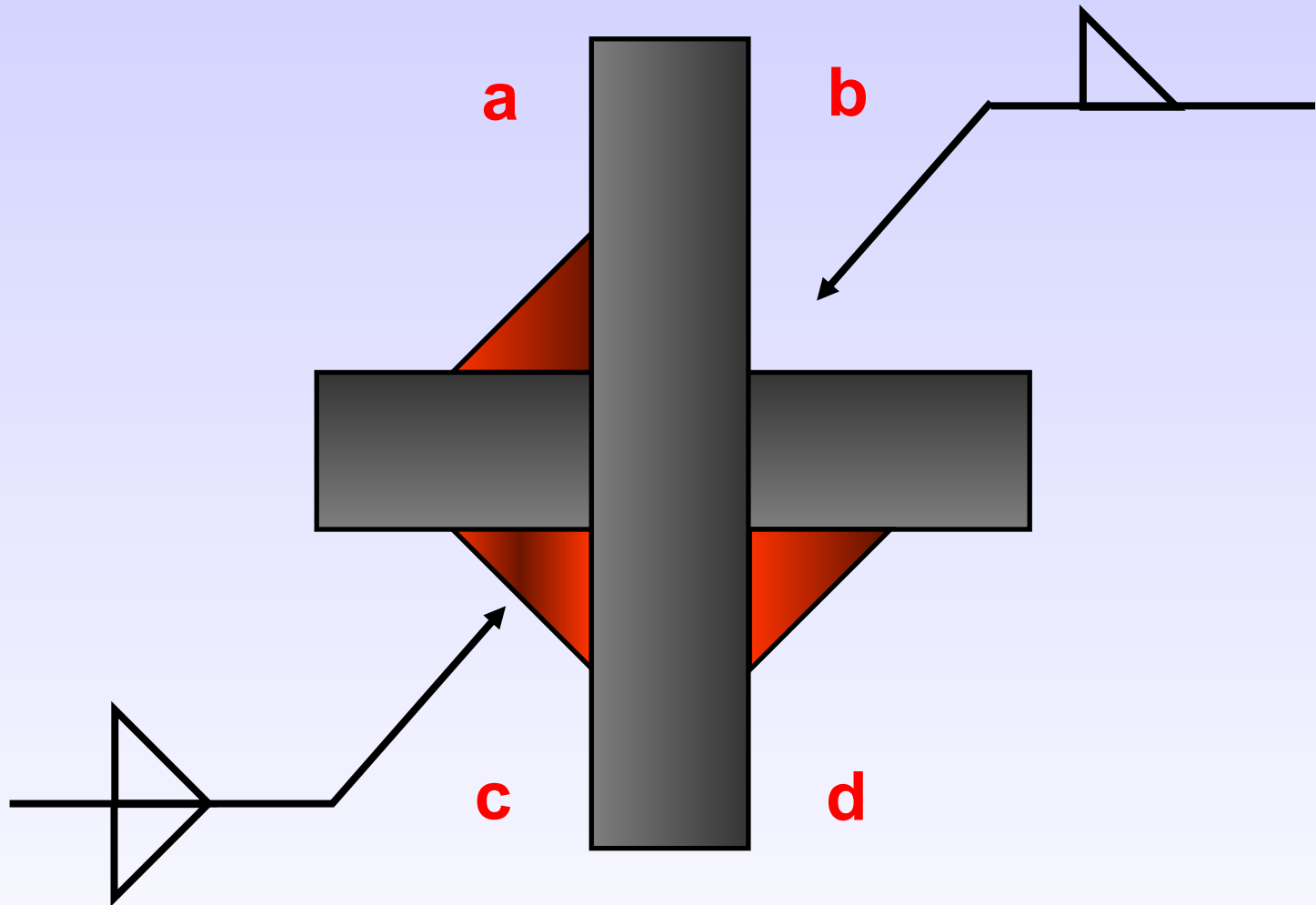


Arrow side

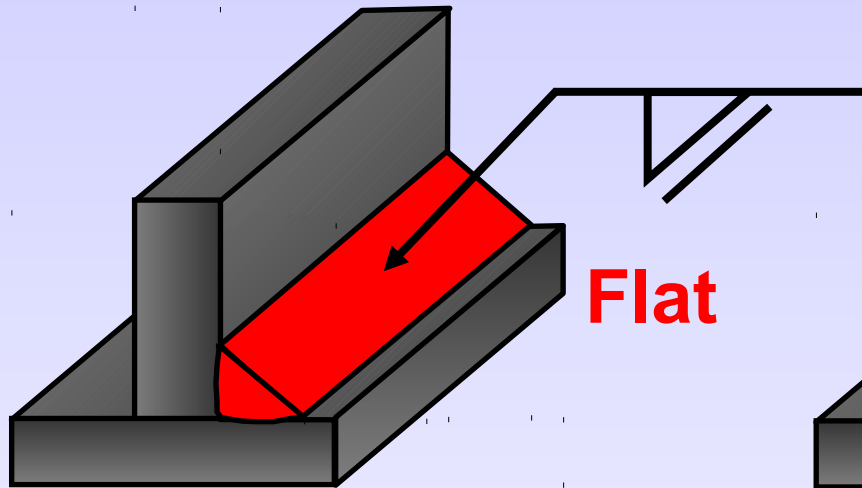


Both sides

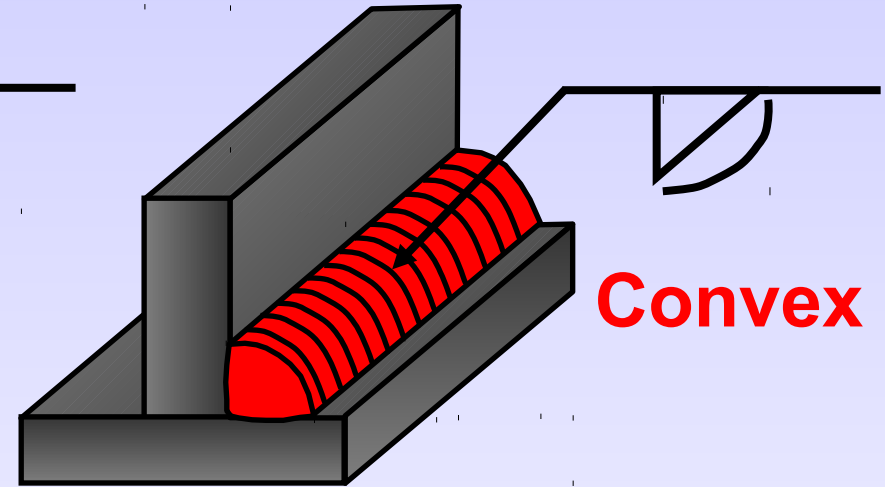
BS 499: part 2. Welding Symbols



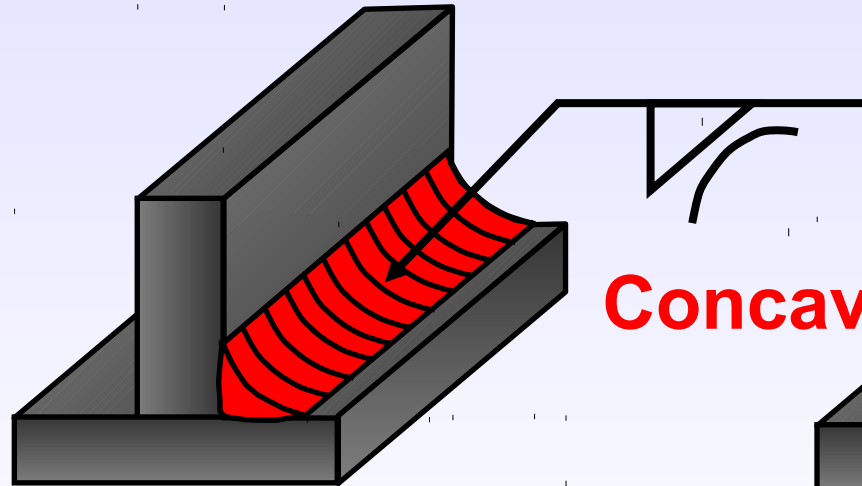
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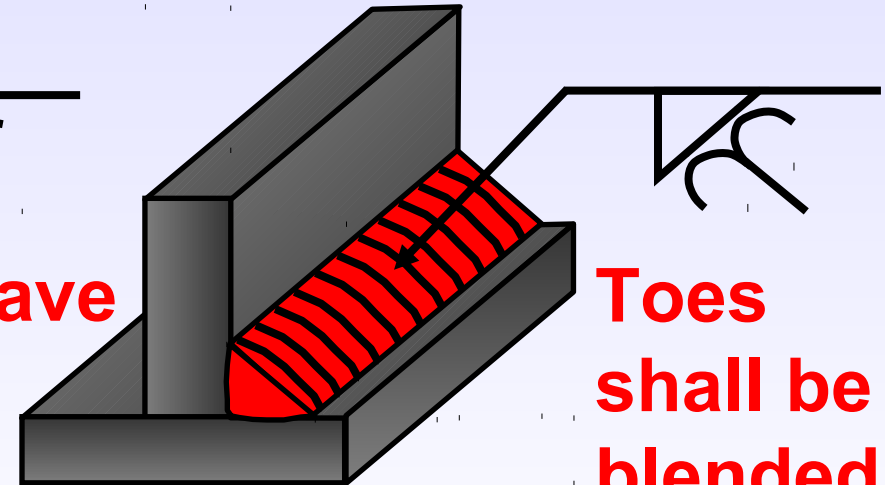
Flat



Convex

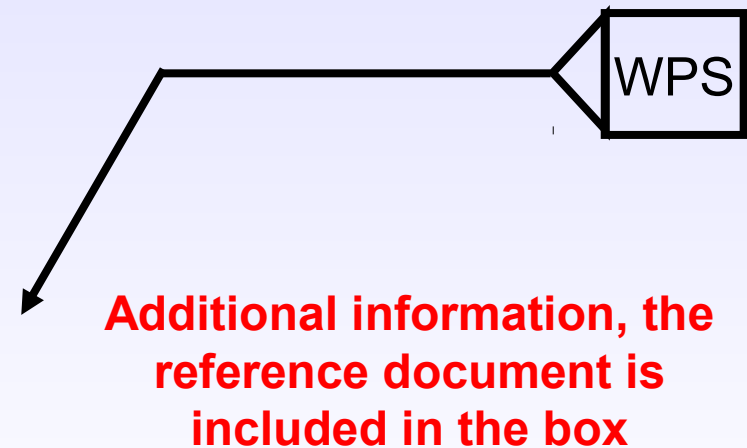
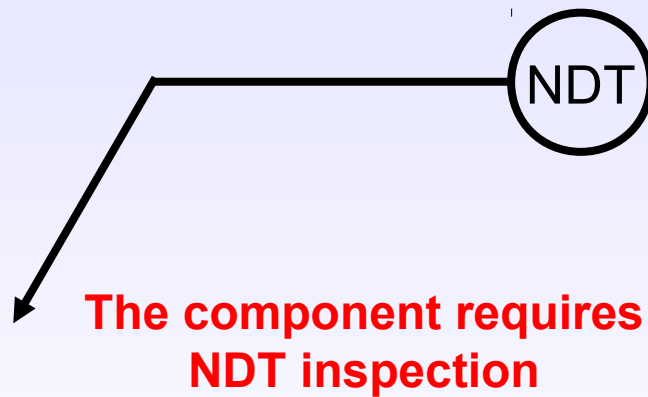
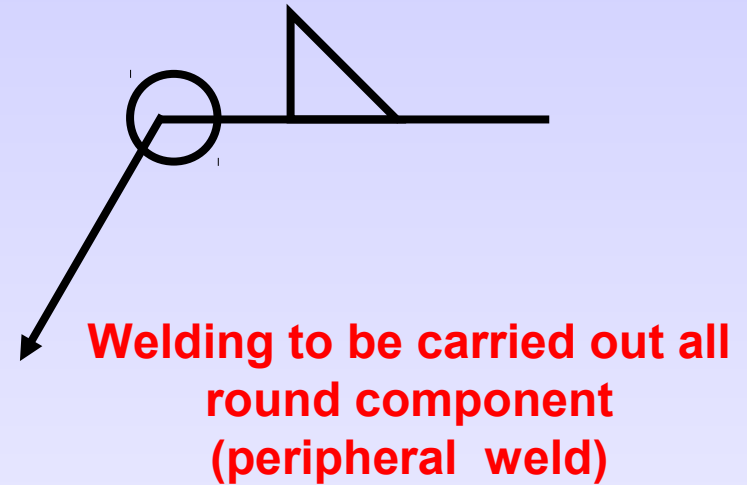
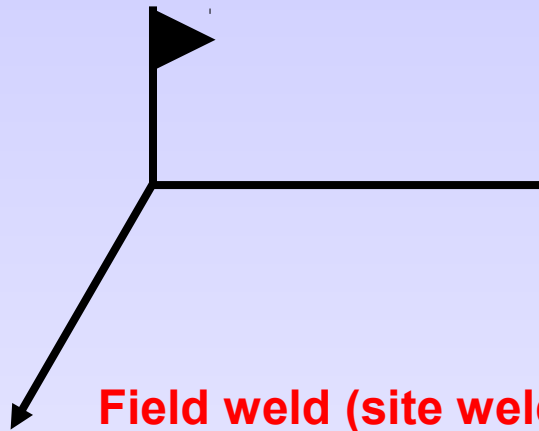


Concave



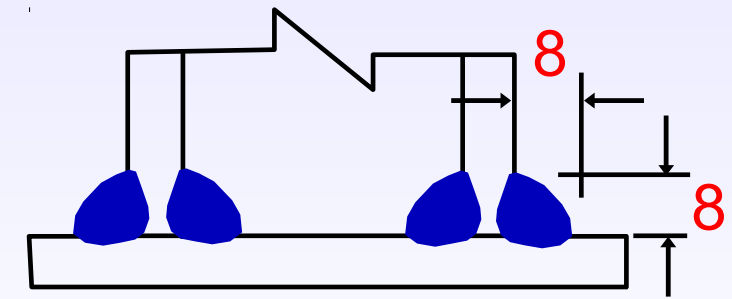
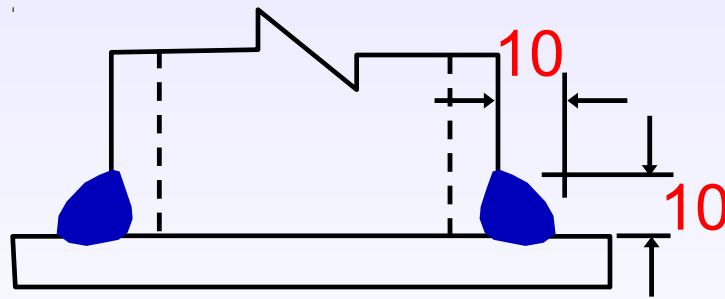
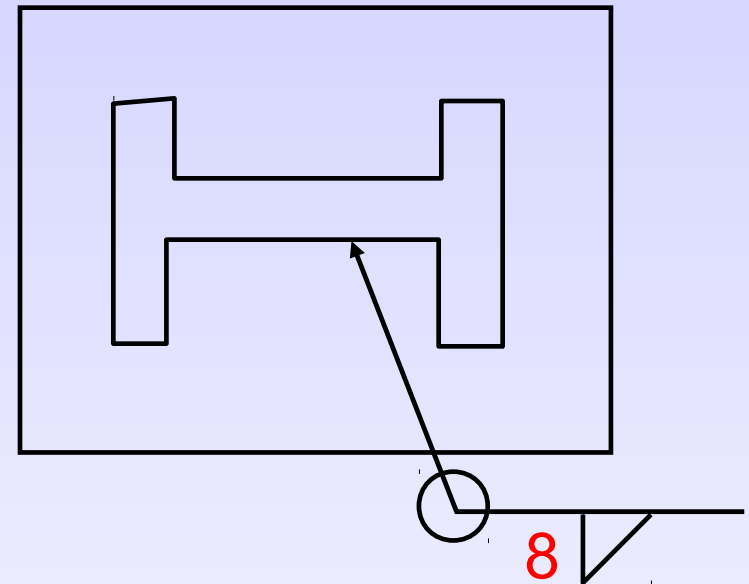
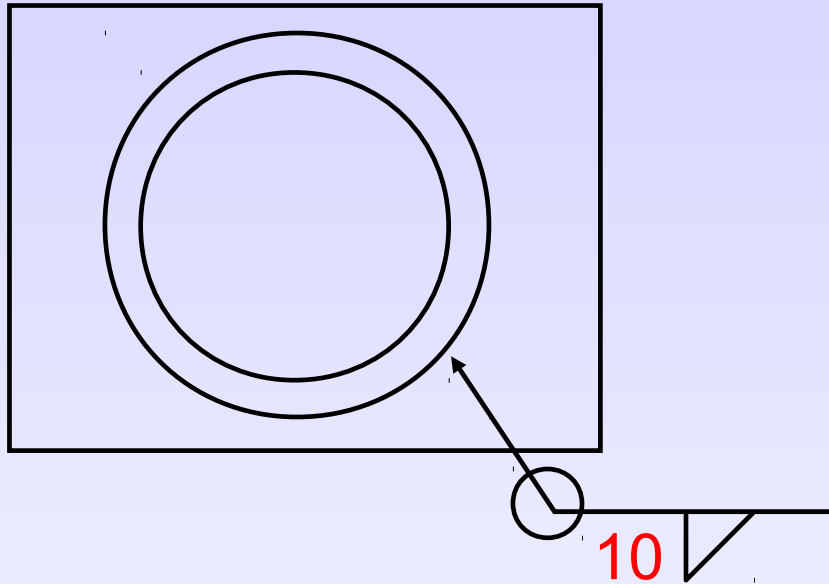
**Toes
shall be
blended**

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BS 499: part 2. Welding Symbols

Peripheral Welds



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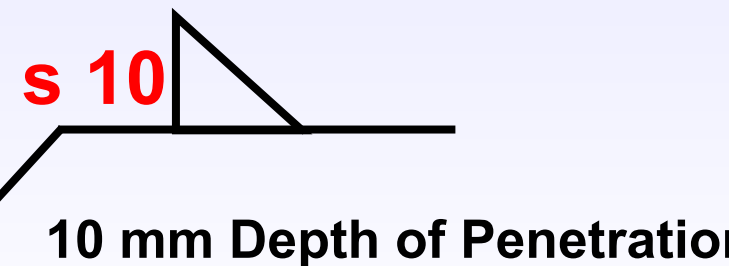
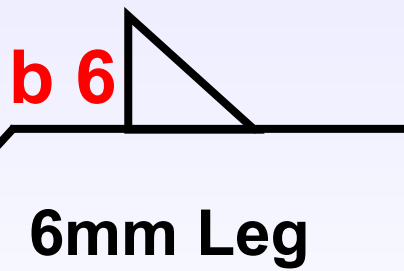
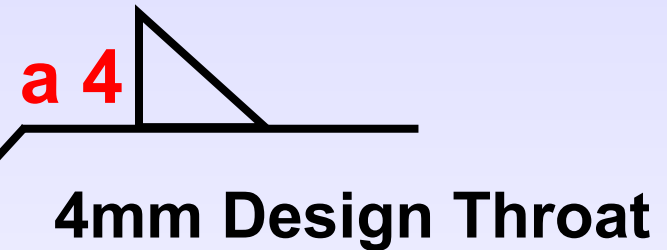
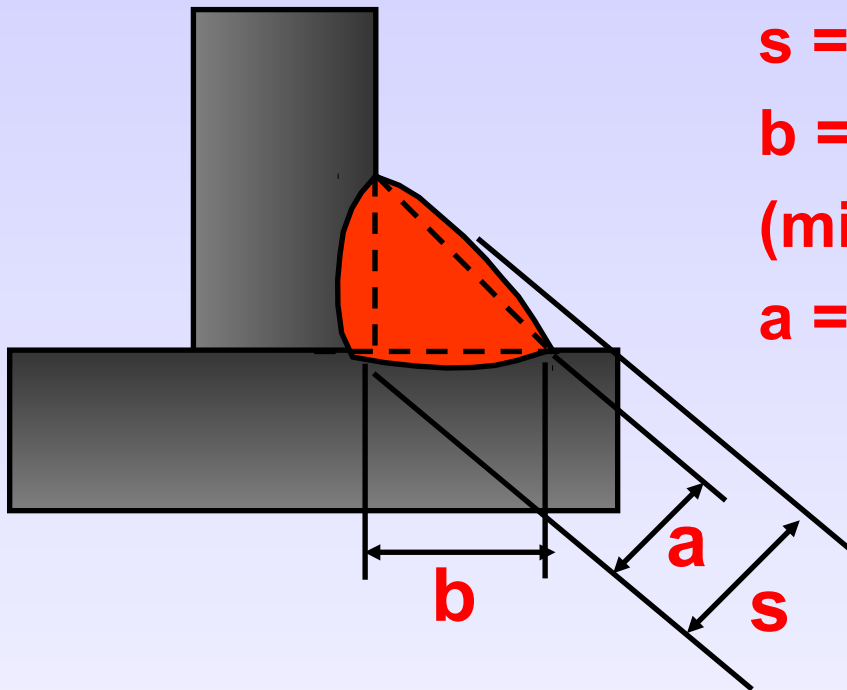
a = Design throat thickness

s = Depth of penetration

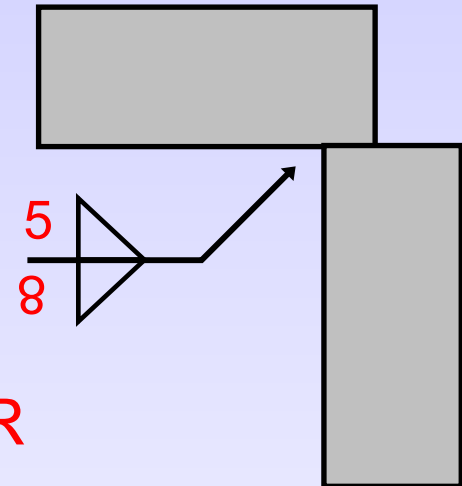
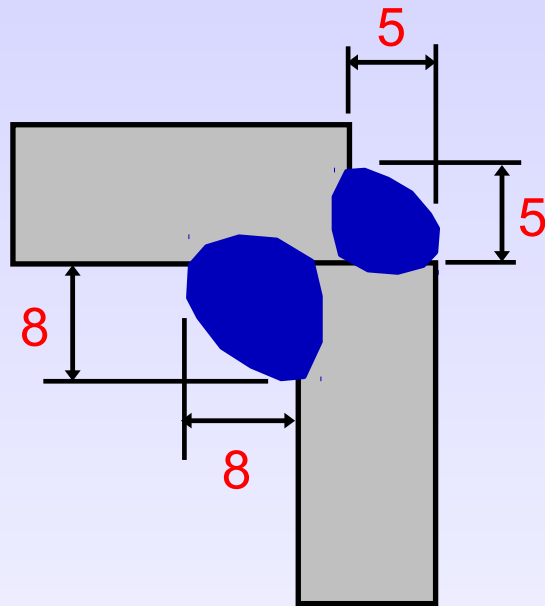
b = Leg length

(min material thickness)

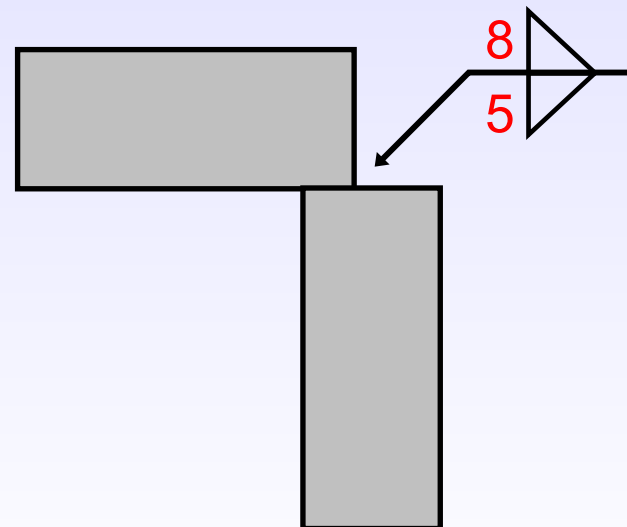
$a = 0.7 \text{ of } b$



BS 499: part 2. Welding Symbols

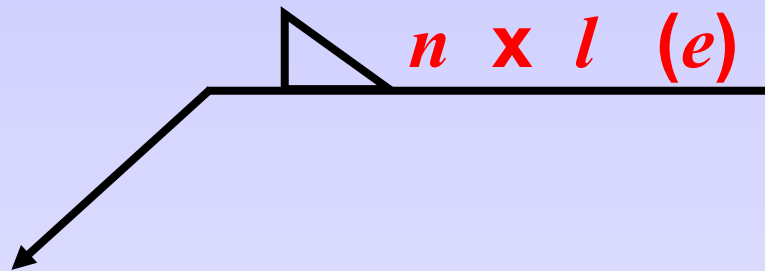


OR

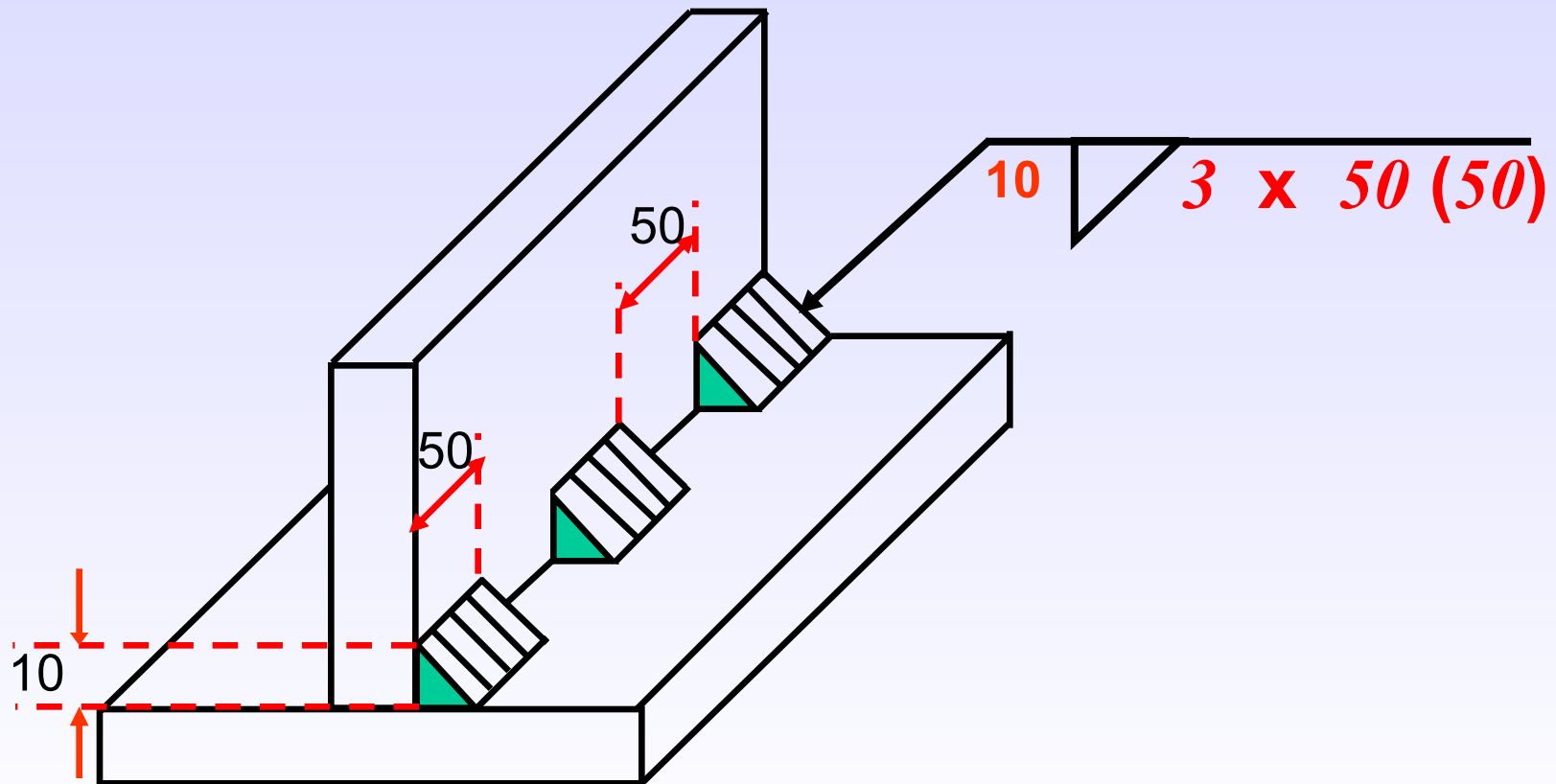


All dimensions in mm

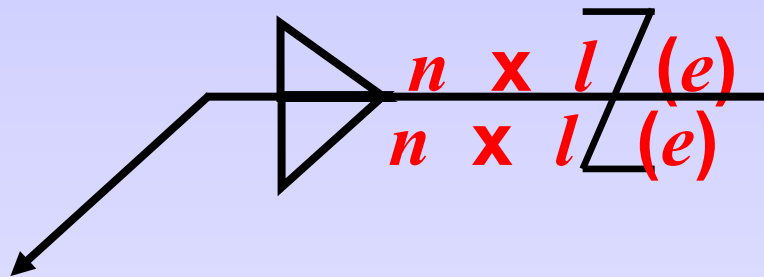
BS 499: part 2. Welding Symbols




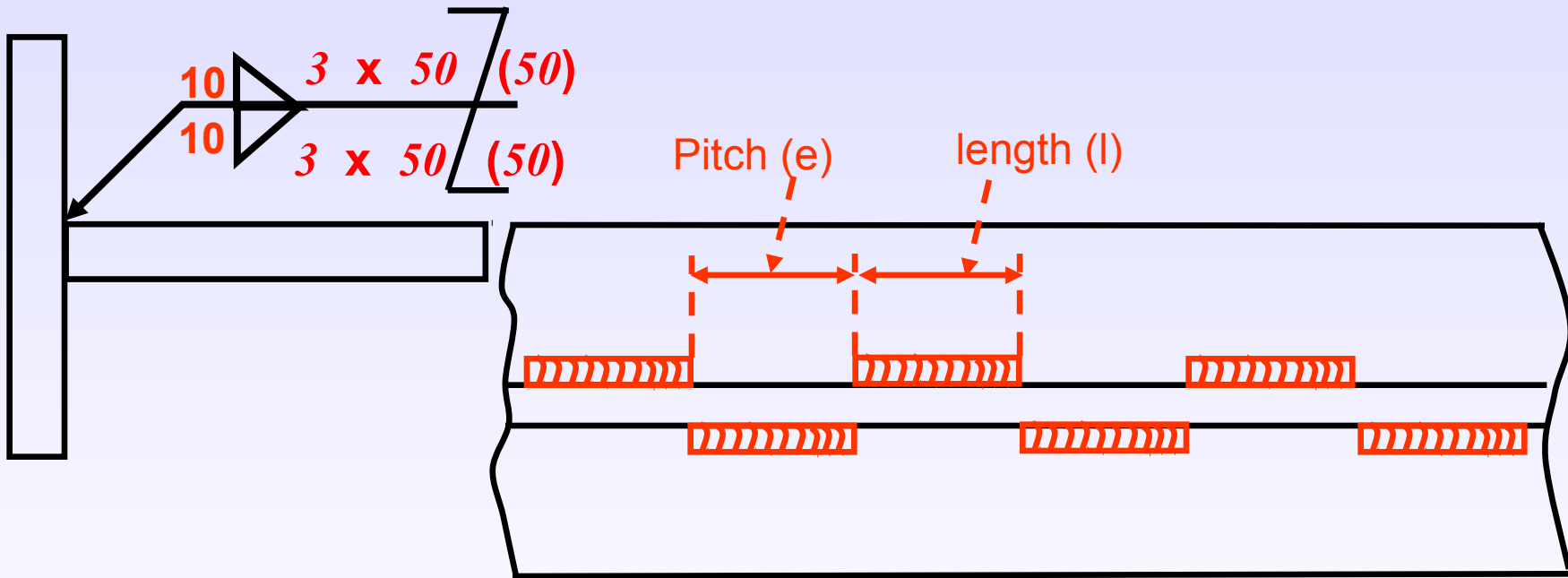
n = number of weld elements
 l = length of each weld element
 (e) = distance between each weld element



BS 499: part 2. Welding Symbols

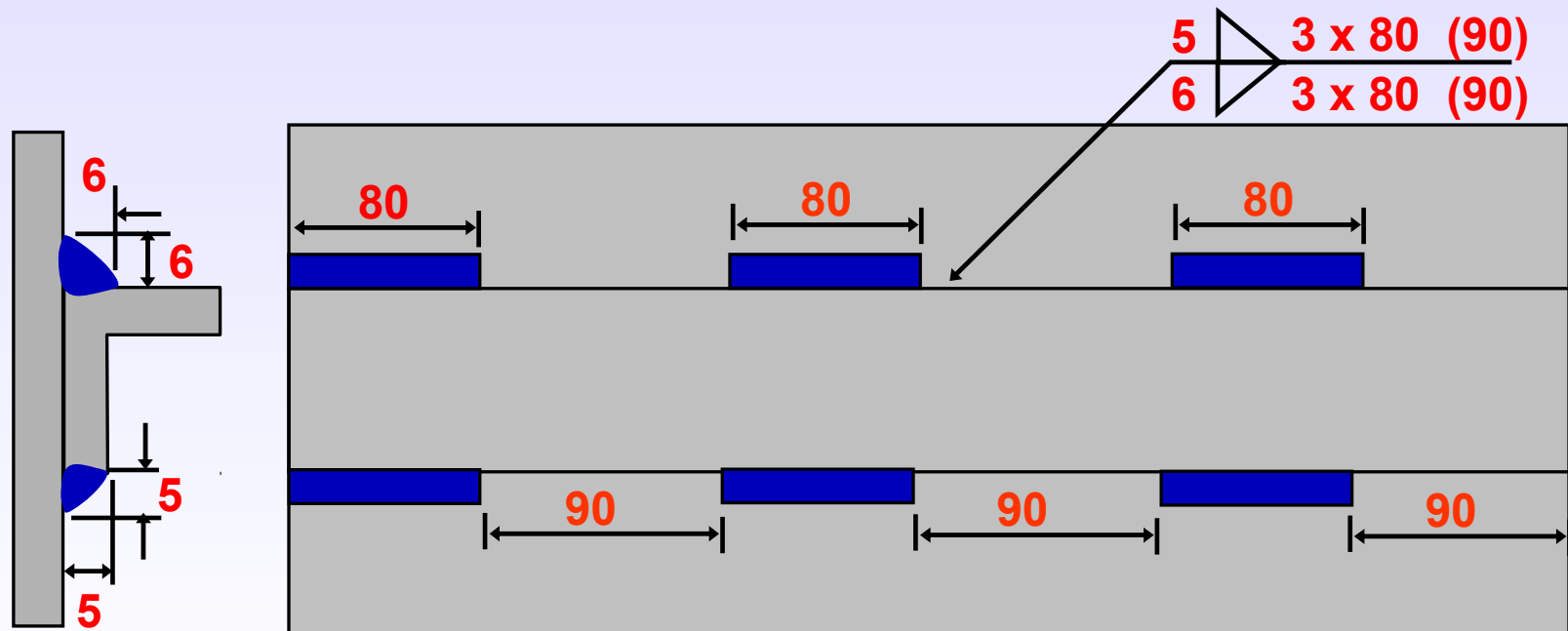
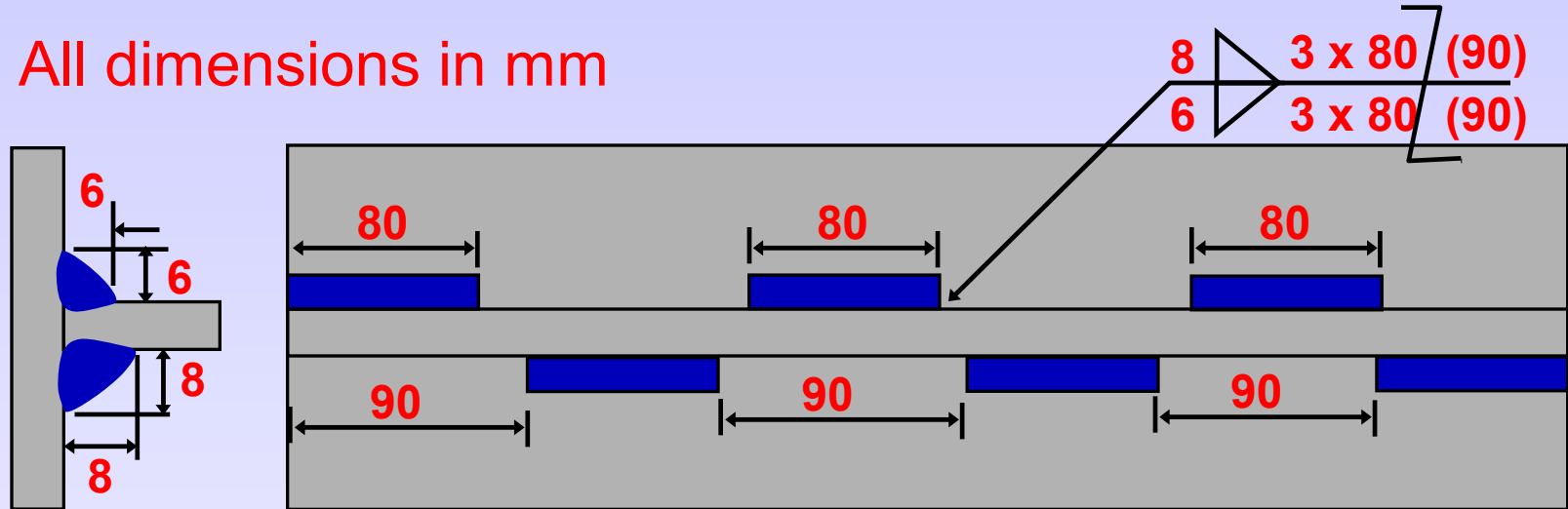


n = number of weld elements
 l = length of each weld element
 (e) = distance between each weld element
 = Weld to be staggered

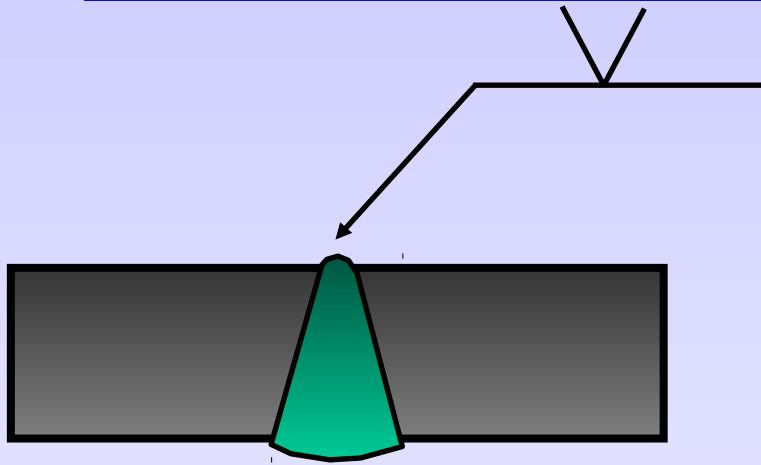


BS 499: part 2. Welding Symbols

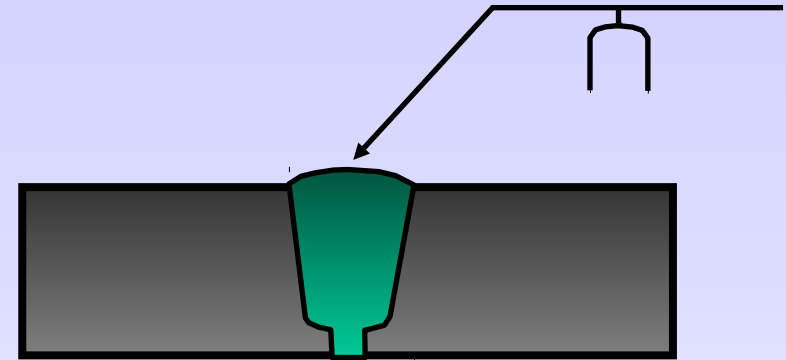
All dimensions in mm



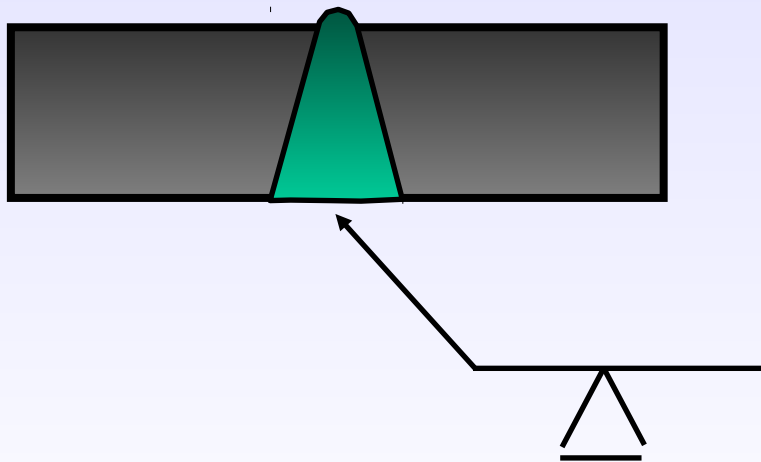
BS 499: part 2. Welding Symbols



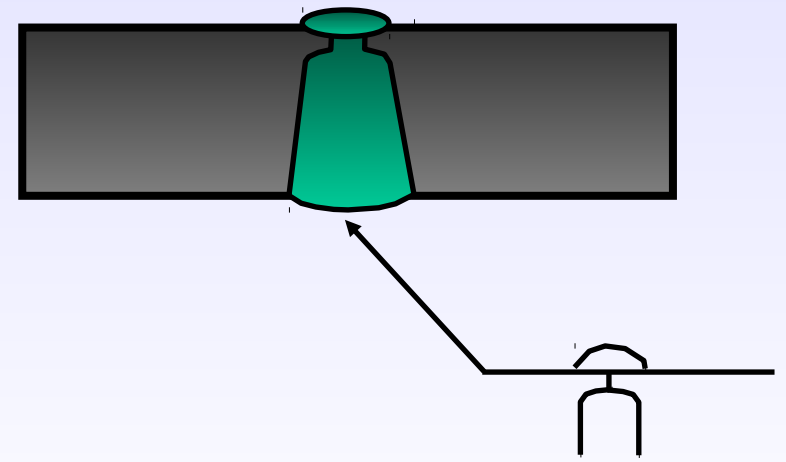
Single-V Butt



Single-U Butt

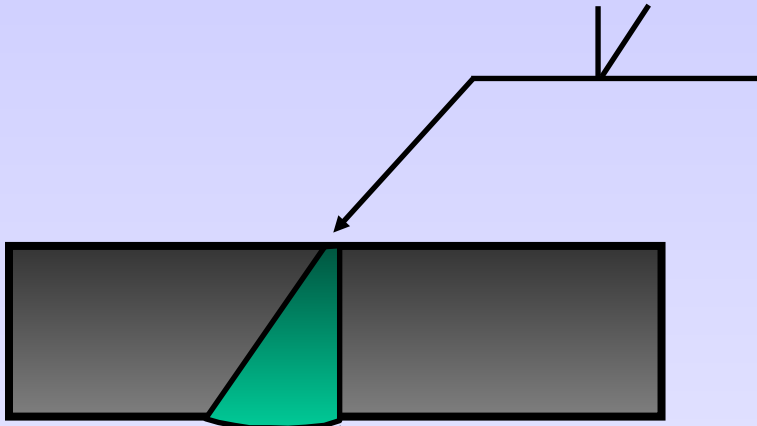


Single-V Butt flush cap

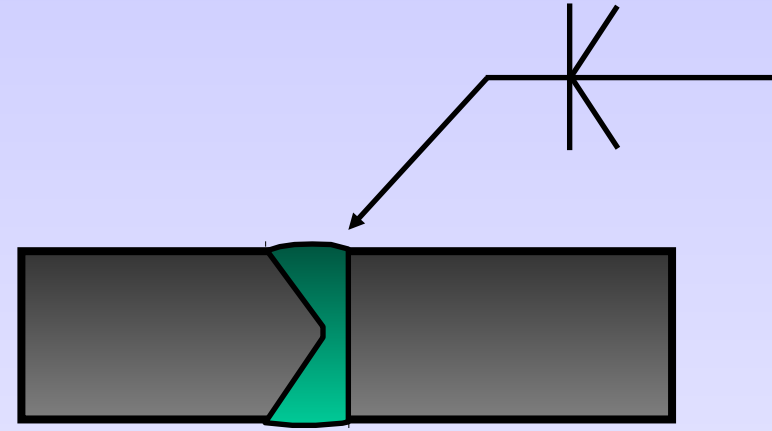


Single-U Butt with sealing run

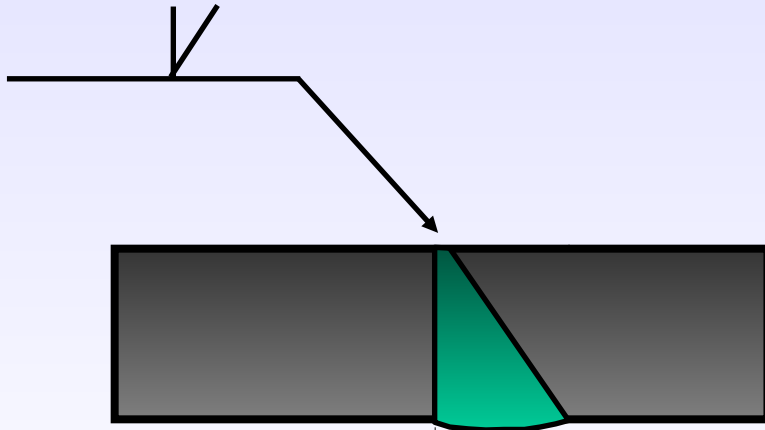
BS 499: part 2. Welding Symbols



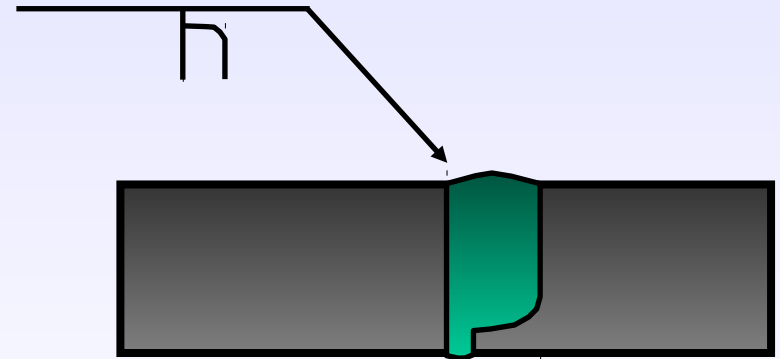
Single-bevel butt



Double-bevel butt

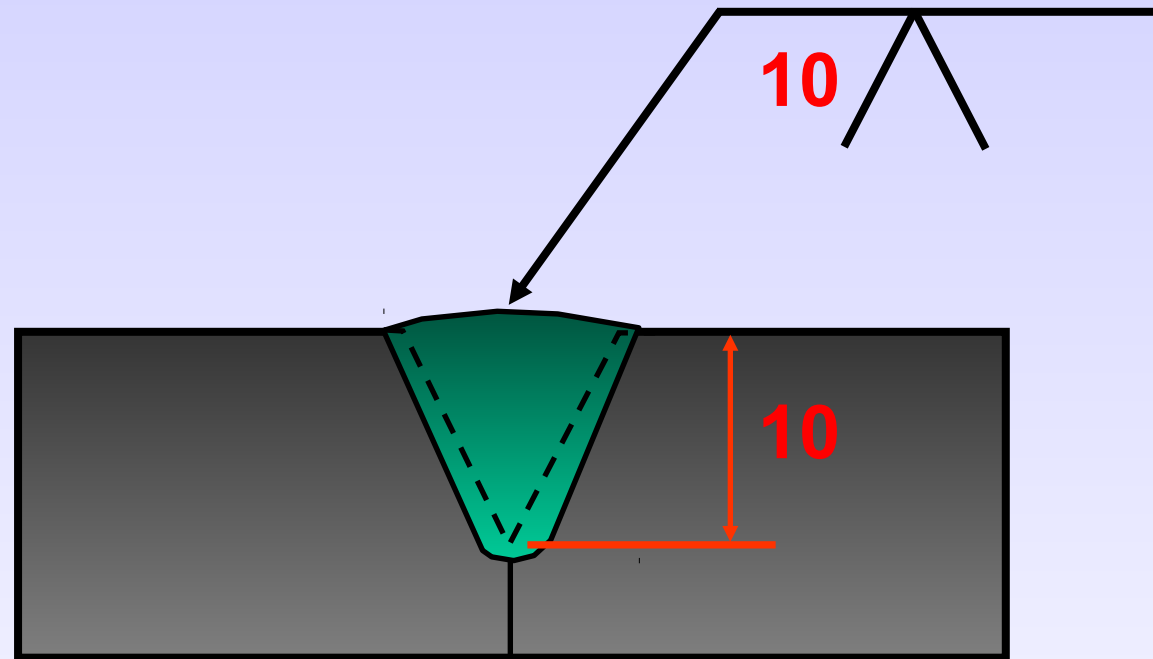


Single-bevel butt



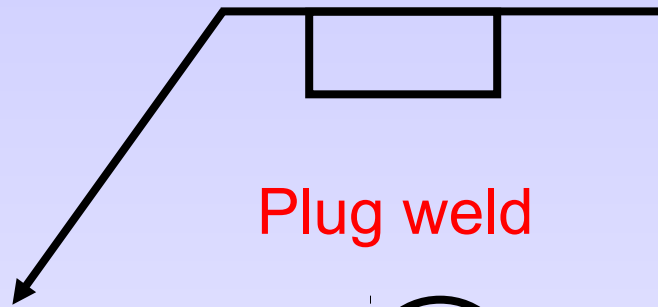
Single-J butt

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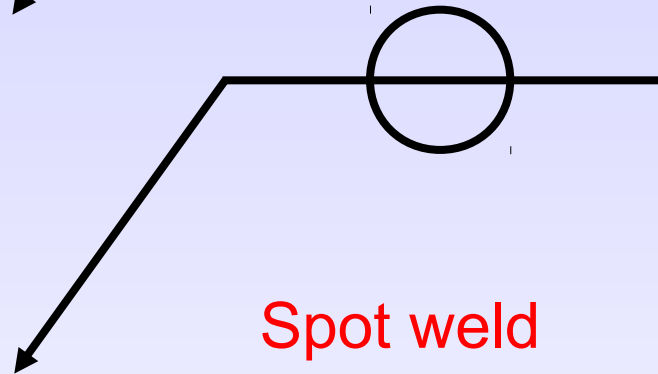


Partial penetration single-V butt

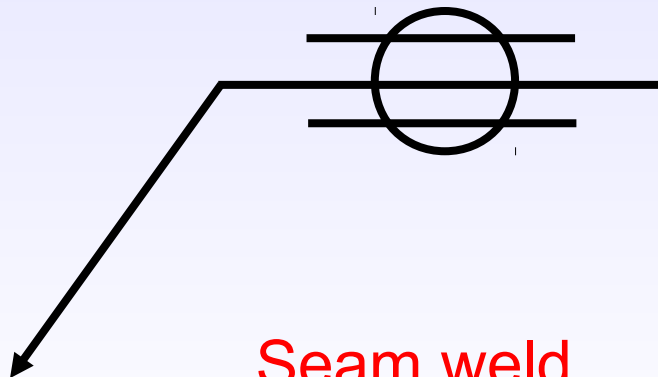
BS 499: part 2. Other Welding Symbols



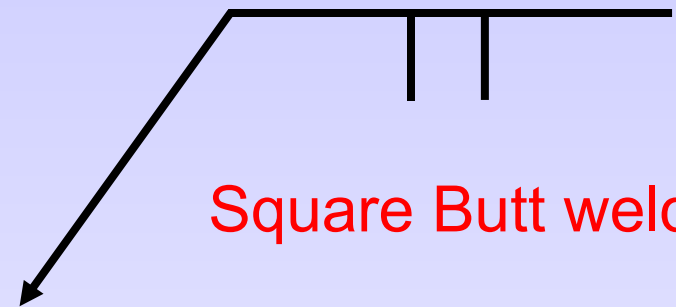
Plug weld



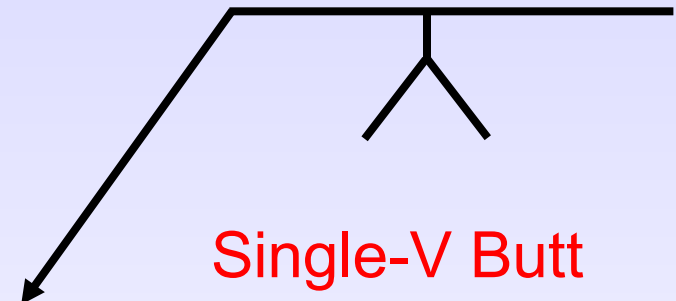
Spot weld



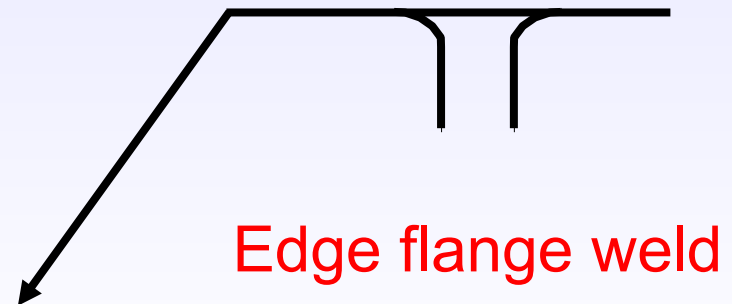
Seam weld



Square Butt weld

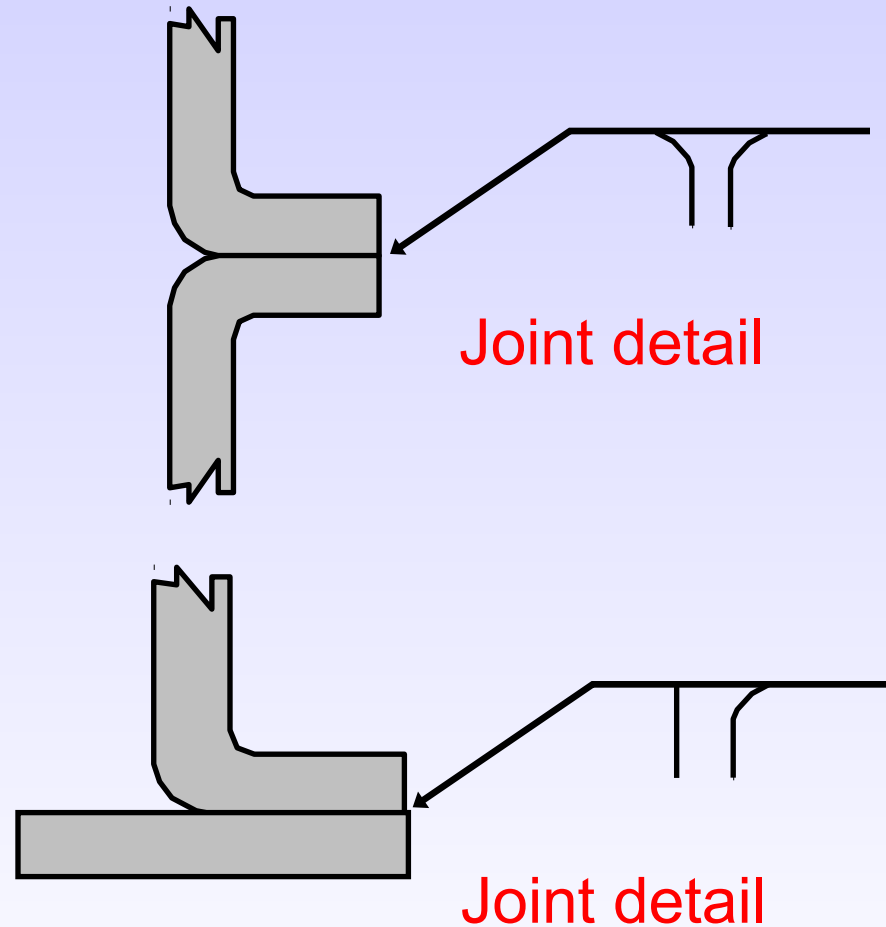
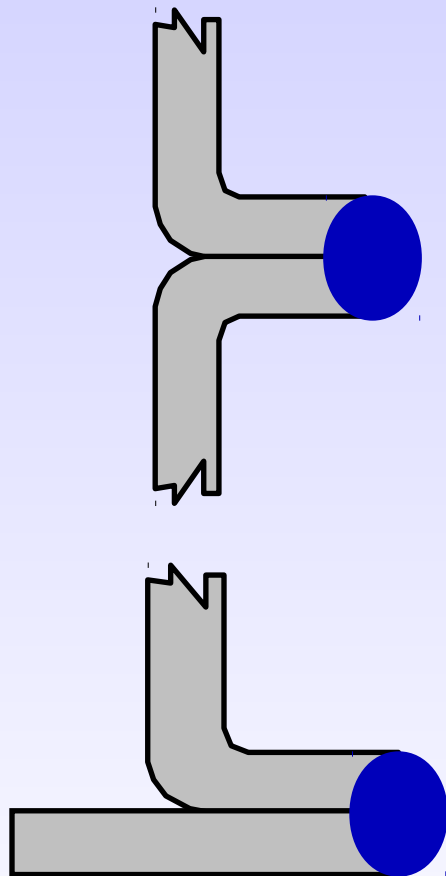


Single-V Butt
broad root face



Edge flange weld

BS 499: part 2. Flared flange Welding Symbols



BS 499: part 2. Numerical Indication of Process

111: MMA welding with covered electrode

121: Sub-arc welding with wire electrode

131: MIG welding with inert gas shield

135: MAG welding with non-inert gas shield

136: Flux core arc welding

141: TIG welding

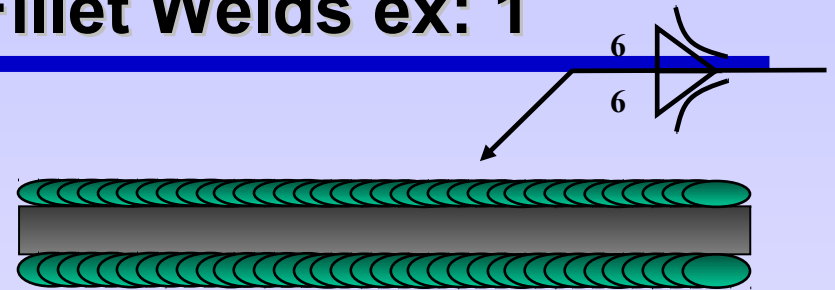
311: Oxy-acetylene welding

72: Electro-slag welding

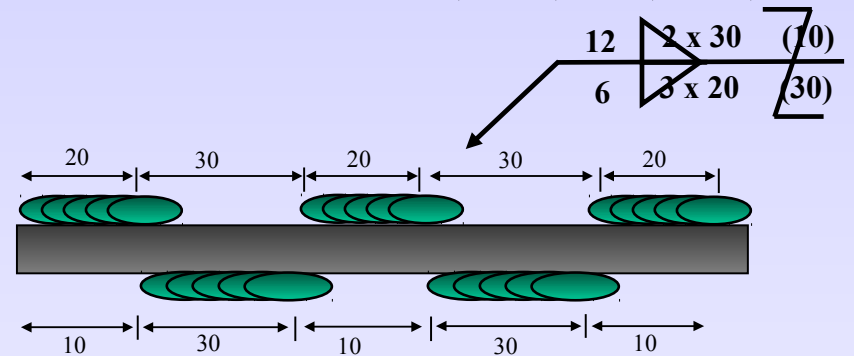
Any Questions?

Ans BS 499: prt. 2 Fillet Welds ex: 1

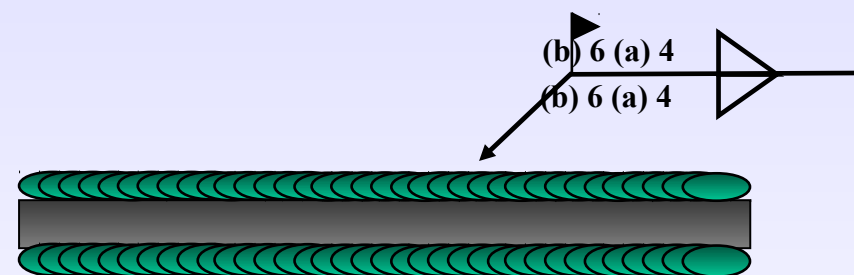
1. **Welded both sides:** A continuous concave fillet weld 6mm leg lengths.



2. **Welded arrow side:** Three intermittent fillet welds, 6 mm leg lengths, the length of each weld 20 mm, the distance between each weld 30 mm.
Welded other side: Two intermittent fillet welds 12 mm leg lengths, the length of each weld 30 mm, the distance between each weld 10 mm. Welds to be staggered.

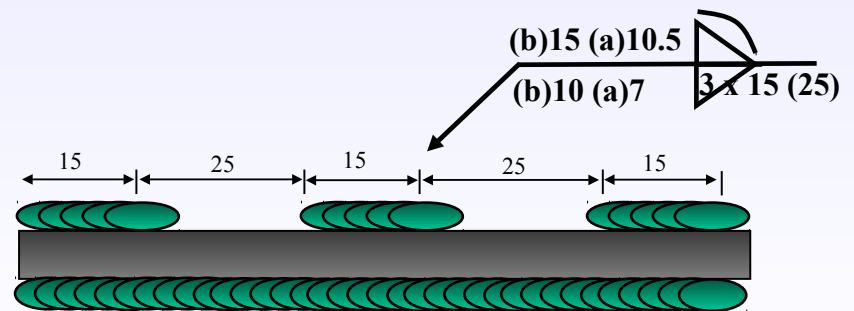


3. **Welded both sides.** A continuous fillet weld, 6 mm leg lengths, 4 mm throat thickness, welds to be carried out on site.



4. **Welded arrow side:** Three intermittent fillet welds 10 mm leg lengths, 7mm throat thickness, length of each weld 15 mm, the distance between each weld 25 mm.

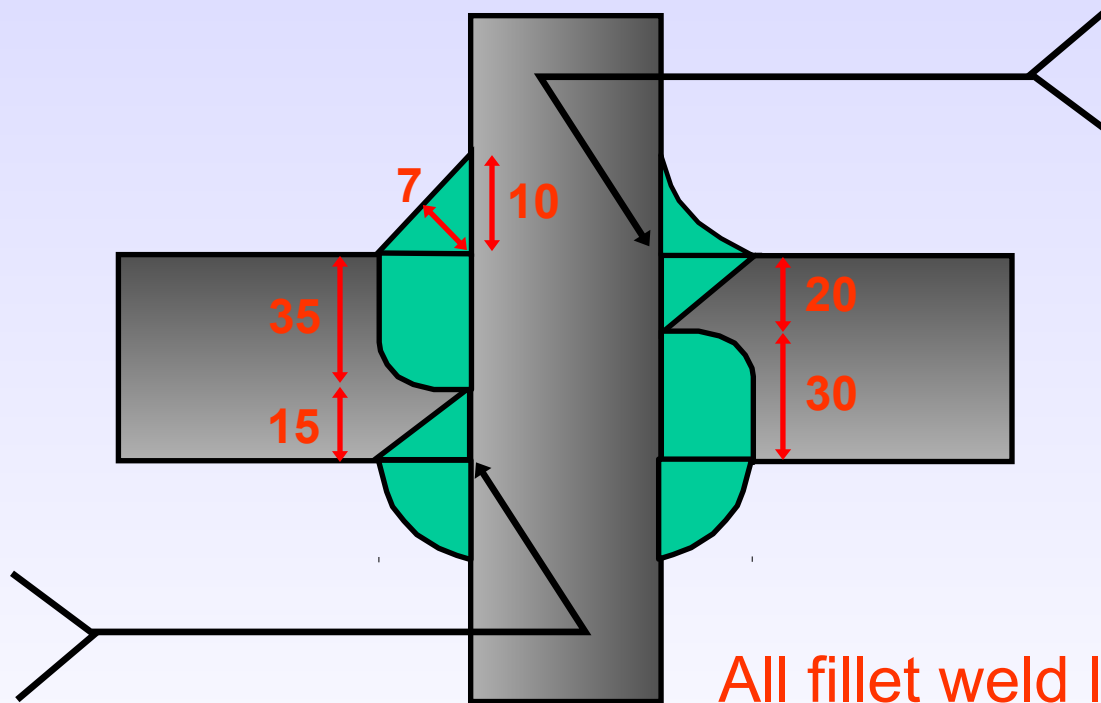
Welded other side: A continuous convex fillet weld, 15 mm leg length, 10.5 mm throat thickness.



BS 499: prt. 2 Butt Weld ex: 1

Complete the symbol drawing for the welded cruciform joint provided below

All welds are welded with the MIG process and fillet welds with the MMA process

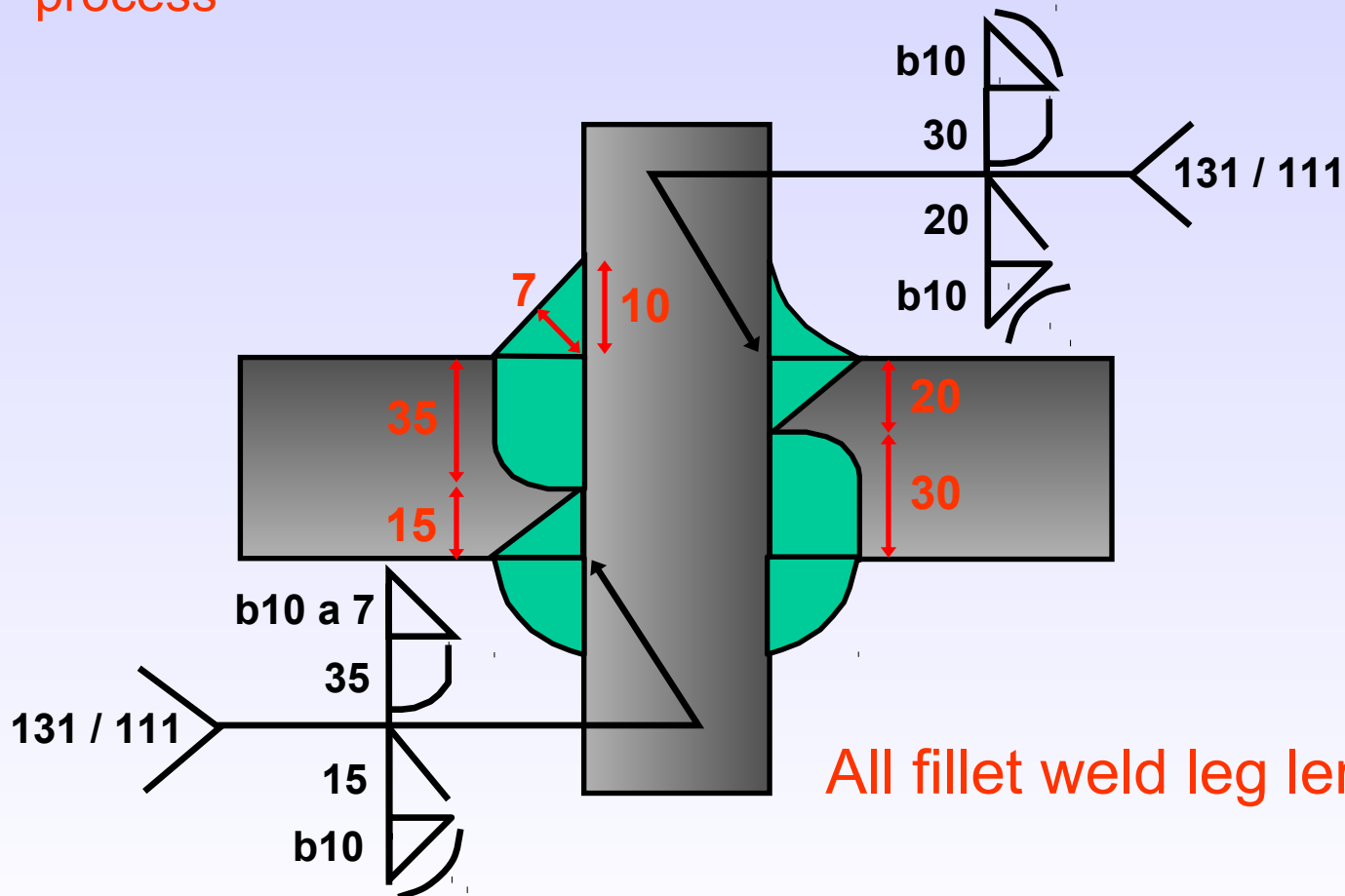


All fillet weld leg lengths 10 mm

Ans BS 499: prt. 2 Butt Weld ex: 1

Complete the symbol drawing for the welded cruciform joint provided below

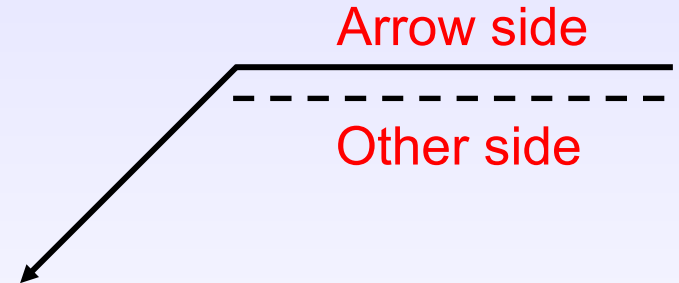
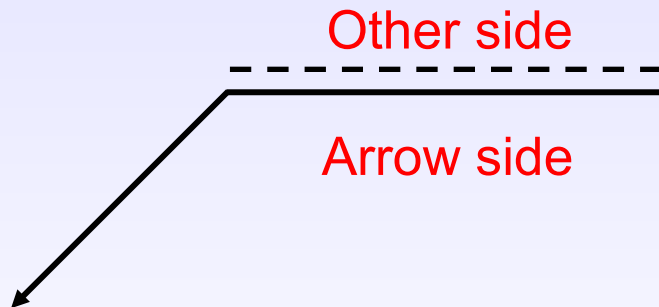
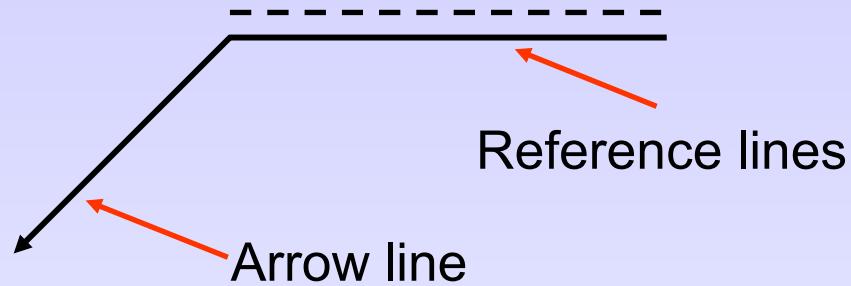
All welds are welded with the MIG process and fillet welds with the MMA process



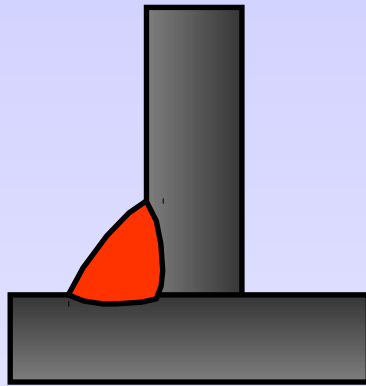
All fillet weld leg lengths 10 mm

BS EN 22553 (ISO 2553) Welding Symbols

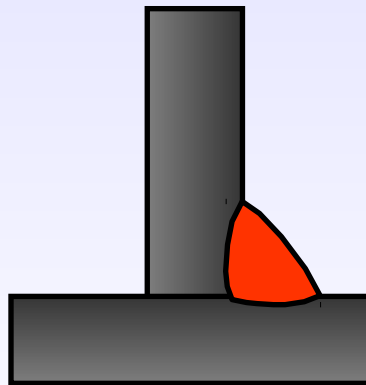
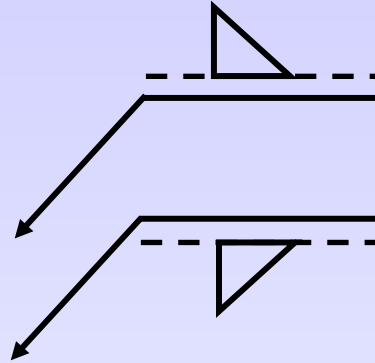
BS EN 22553 (ISO 2553) Welding Symbols



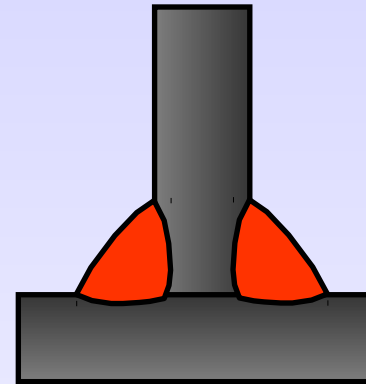
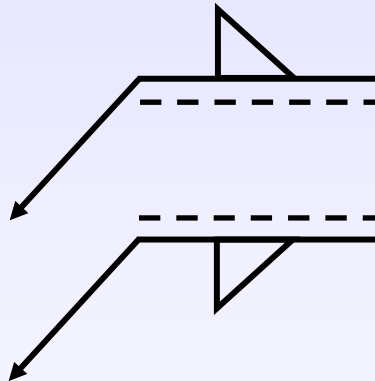
BS EN 22553 (ISO 2553) Welding Symbols



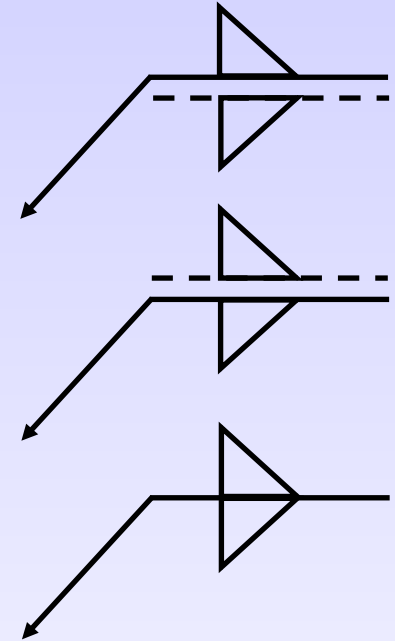
Other side



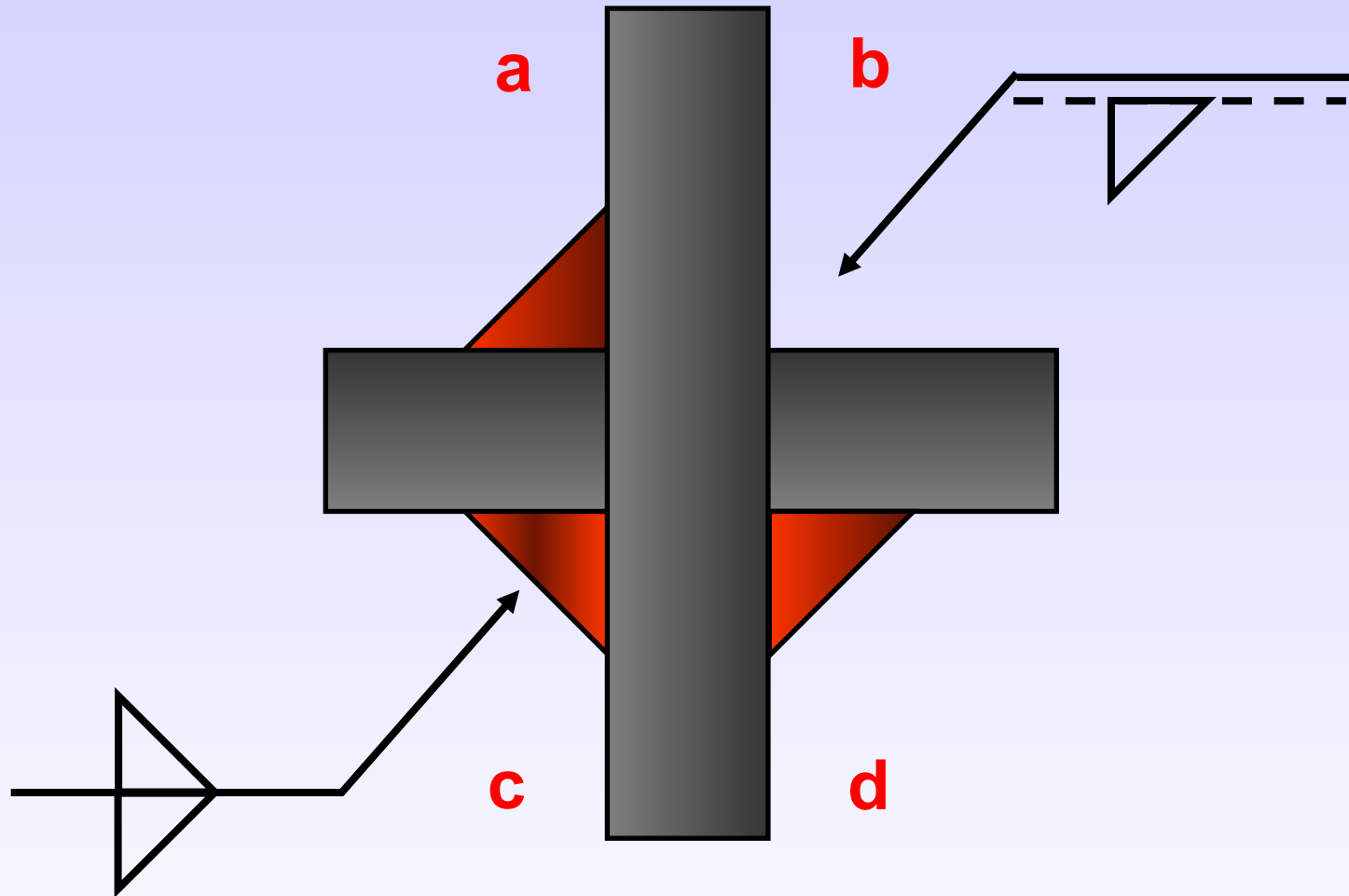
Arrow side



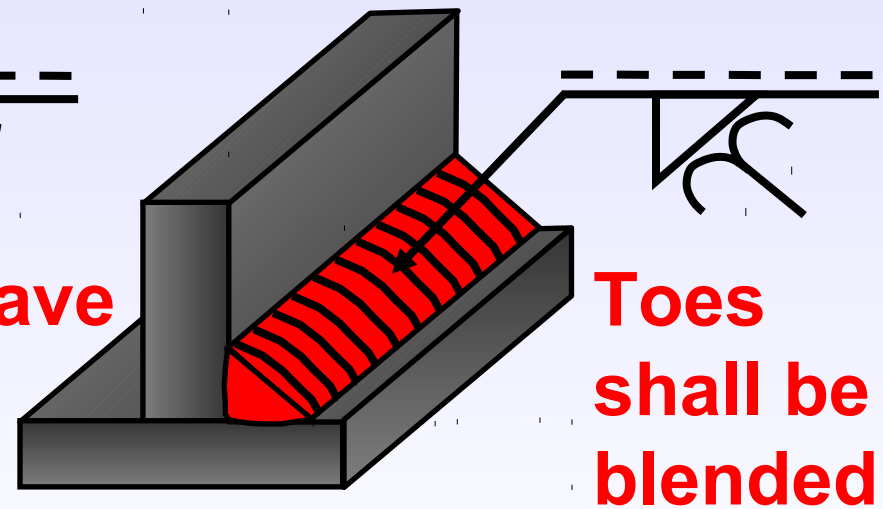
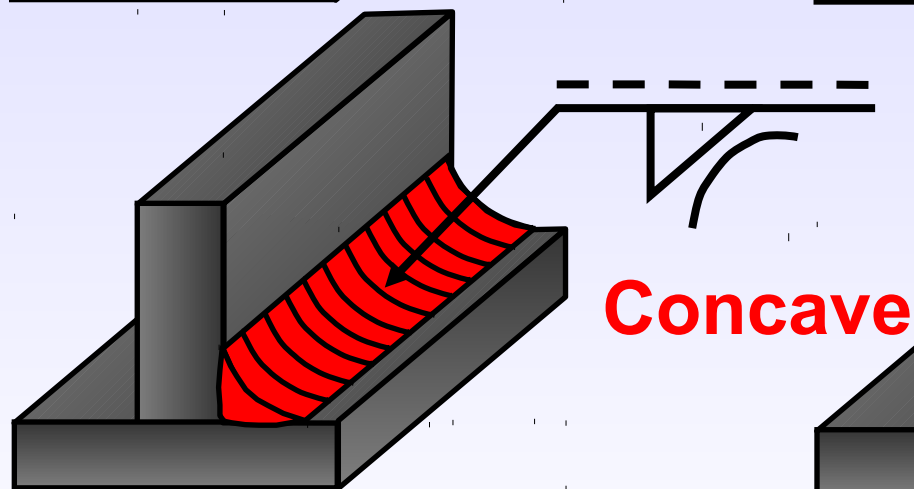
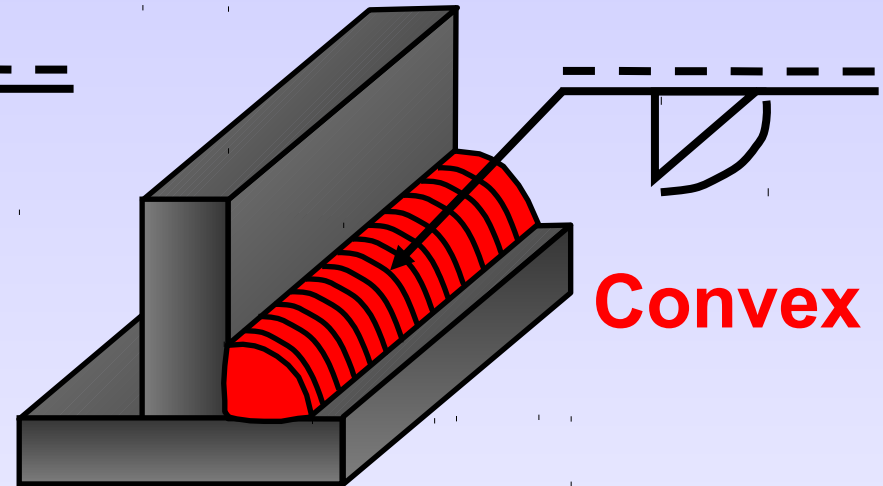
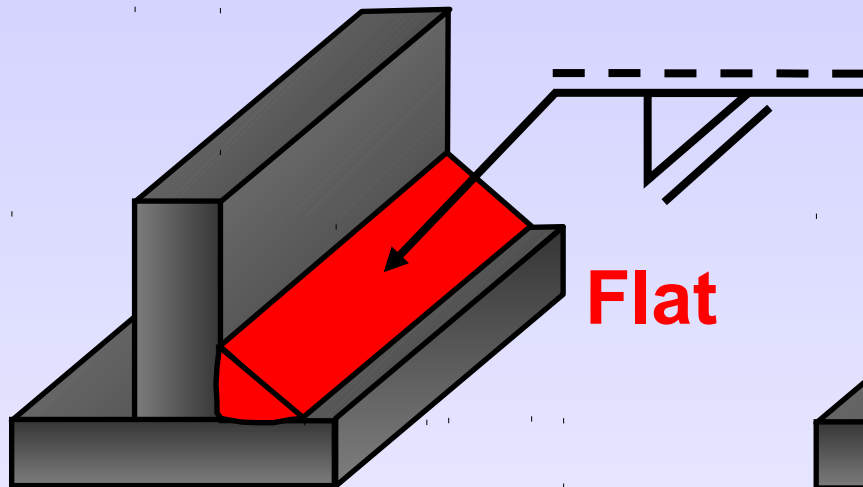
Both sides



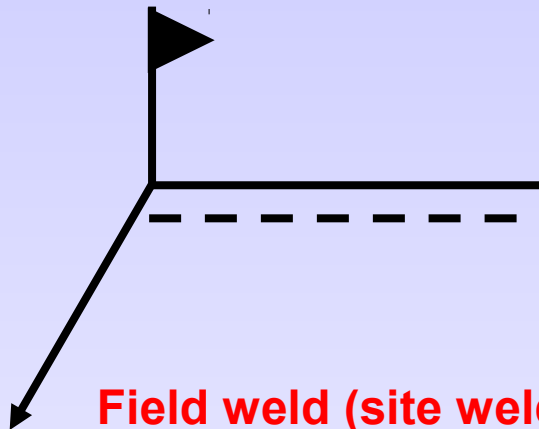
BS EN 22553 (ISO 2553) Welding Symbols



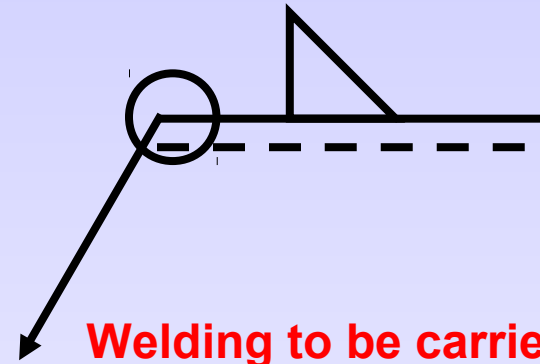
BS EN 22553 (ISO 2553) Welding Symbols



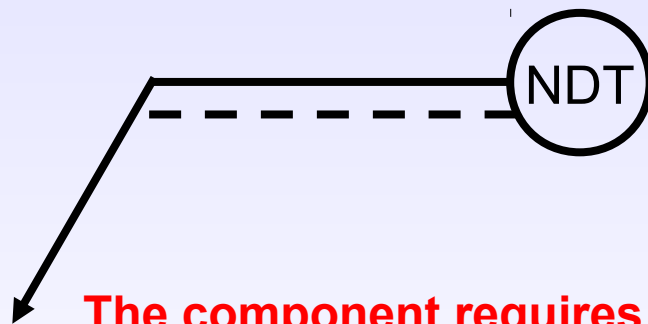
BS EN 22553 (ISO 2553) Welding Symbols



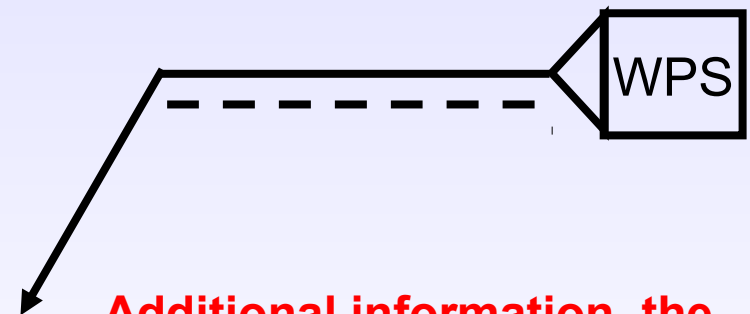
Field weld (site weld)



Welding to be carried out all round component (peripheral weld)



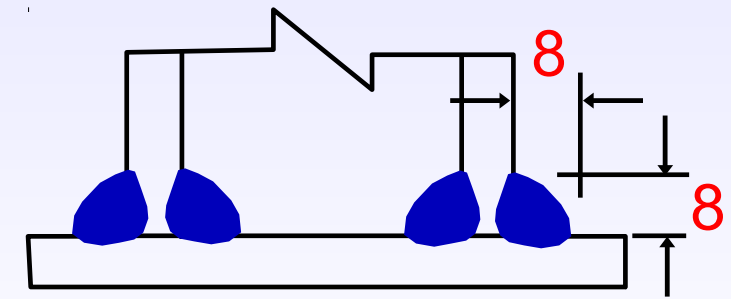
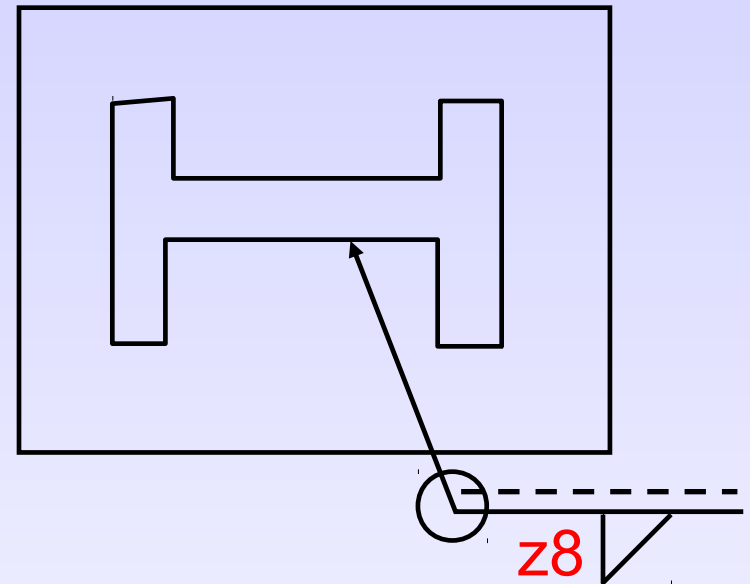
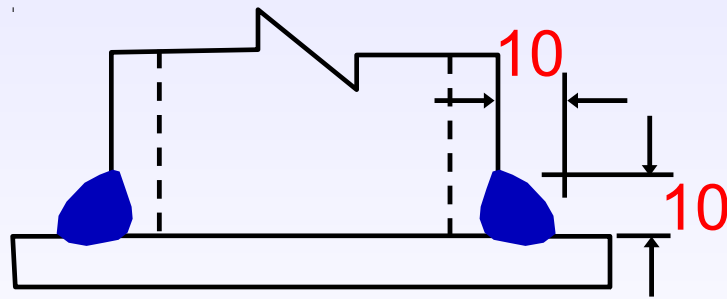
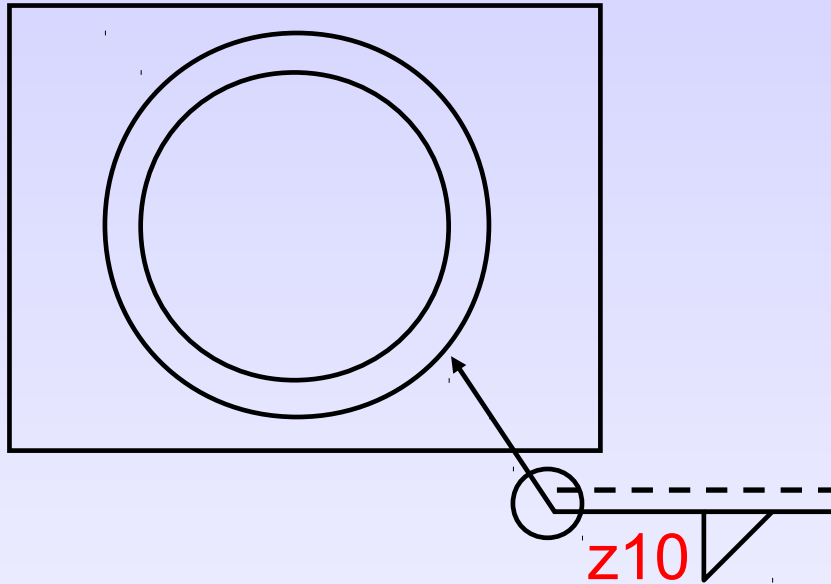
The component requires NDT inspection



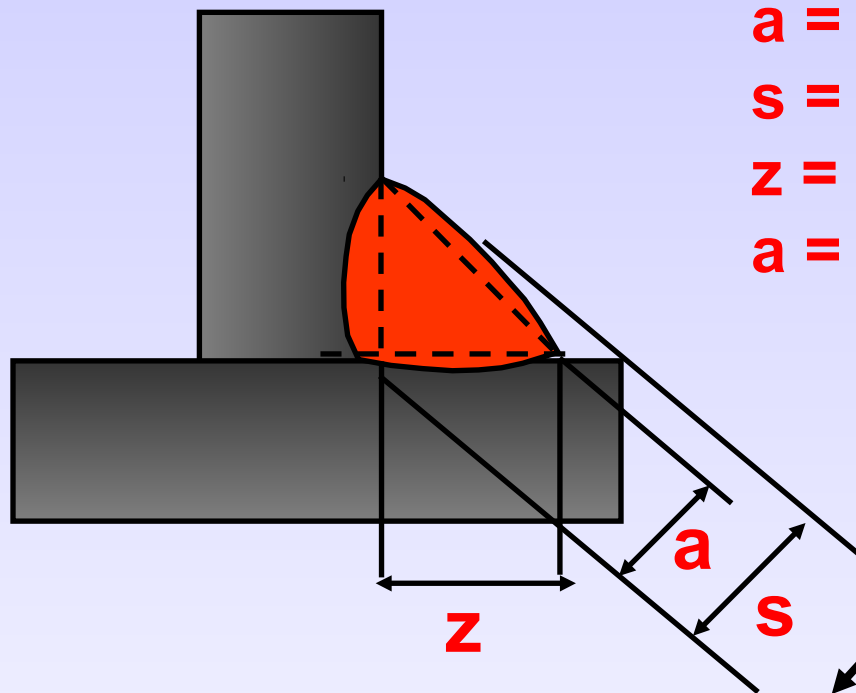
Additional information, the reference document is included in the box

BS EN 22553 (ISO 2553) Welding Symbols

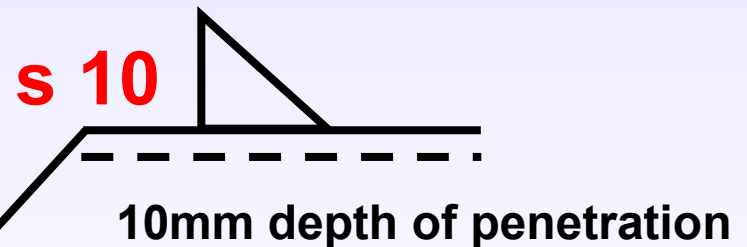
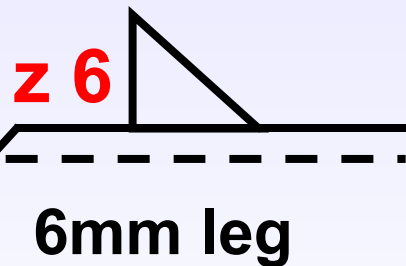
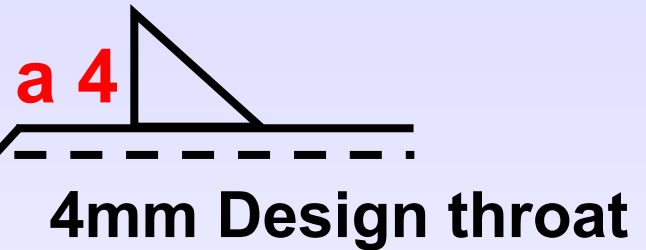
Peripheral Welds



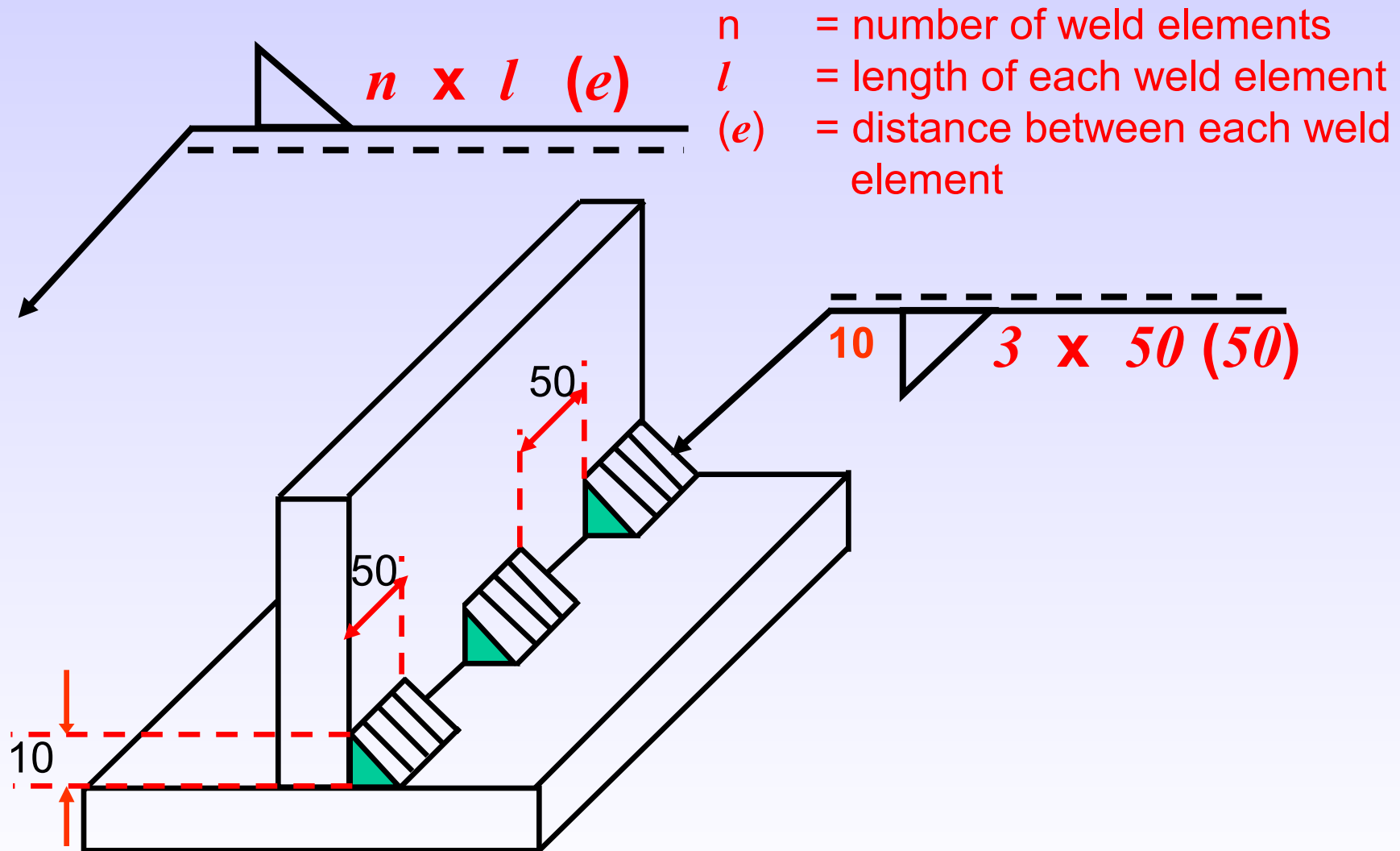
BS EN 22553 (ISO 2553) Welding Symbols



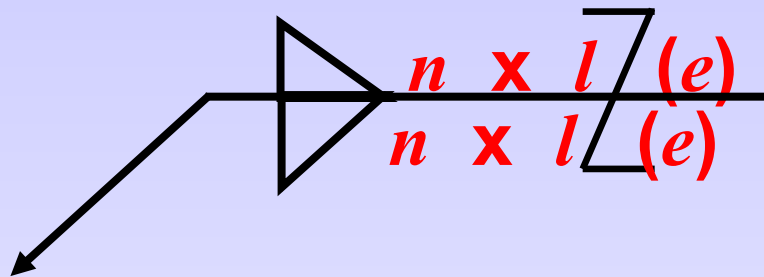
a = Design throat thickness
s = Depth of penetration
z = Leg length
 $a = 0.7 \text{ of } z$




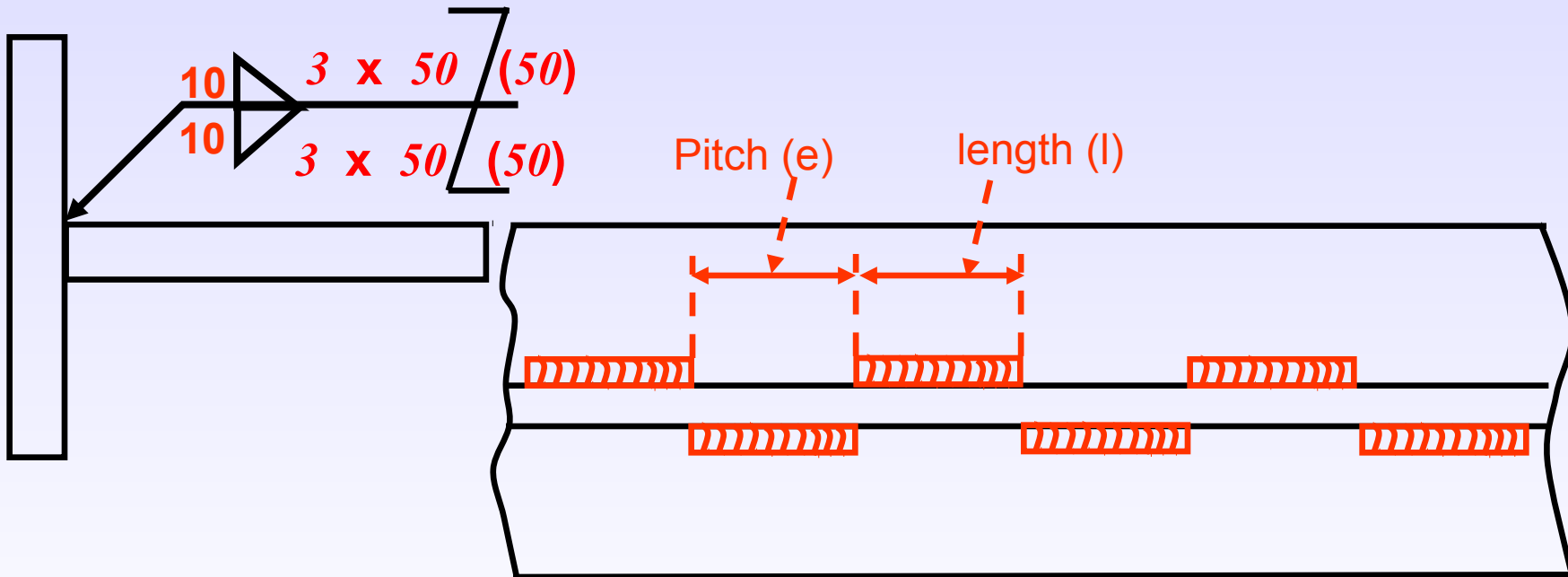
BS EN 22553 (ISO 2553) Welding Symbols



BS EN 22553 (ISO 2553) Welding Symbols

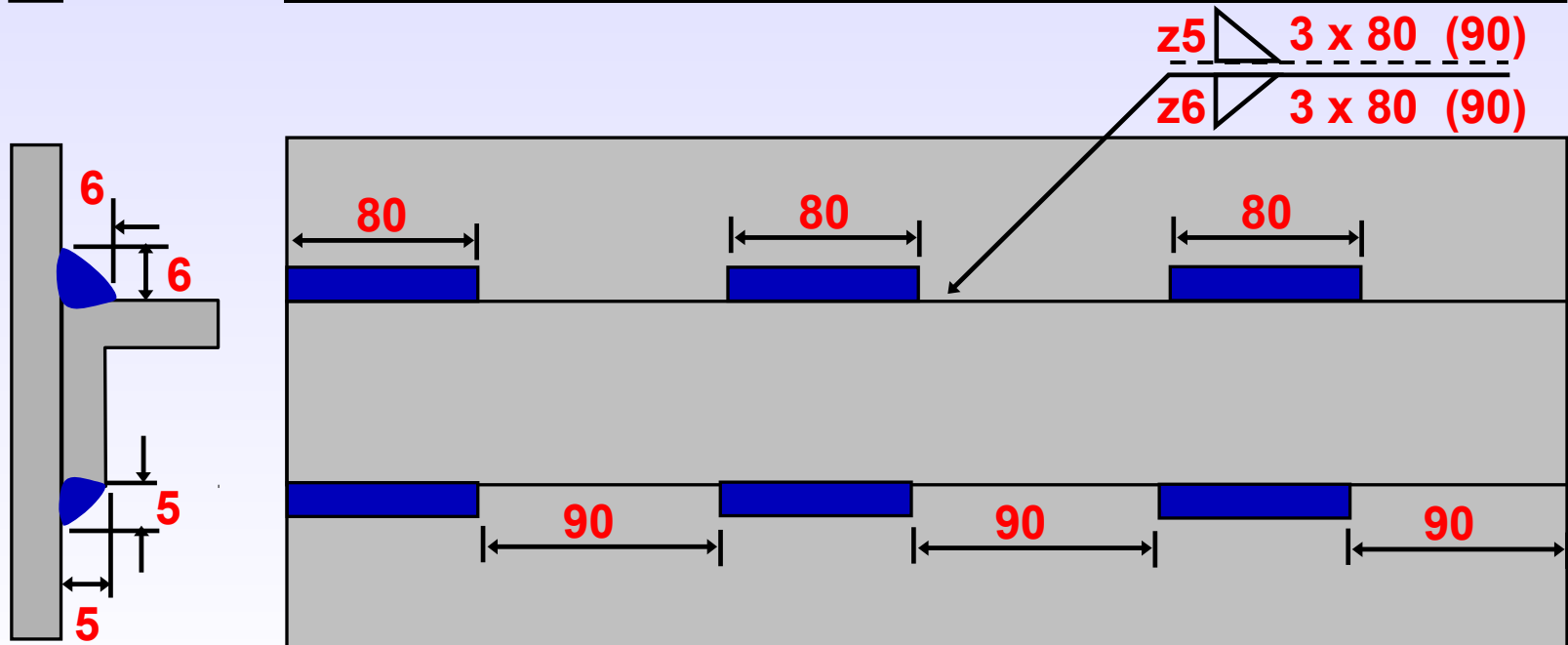
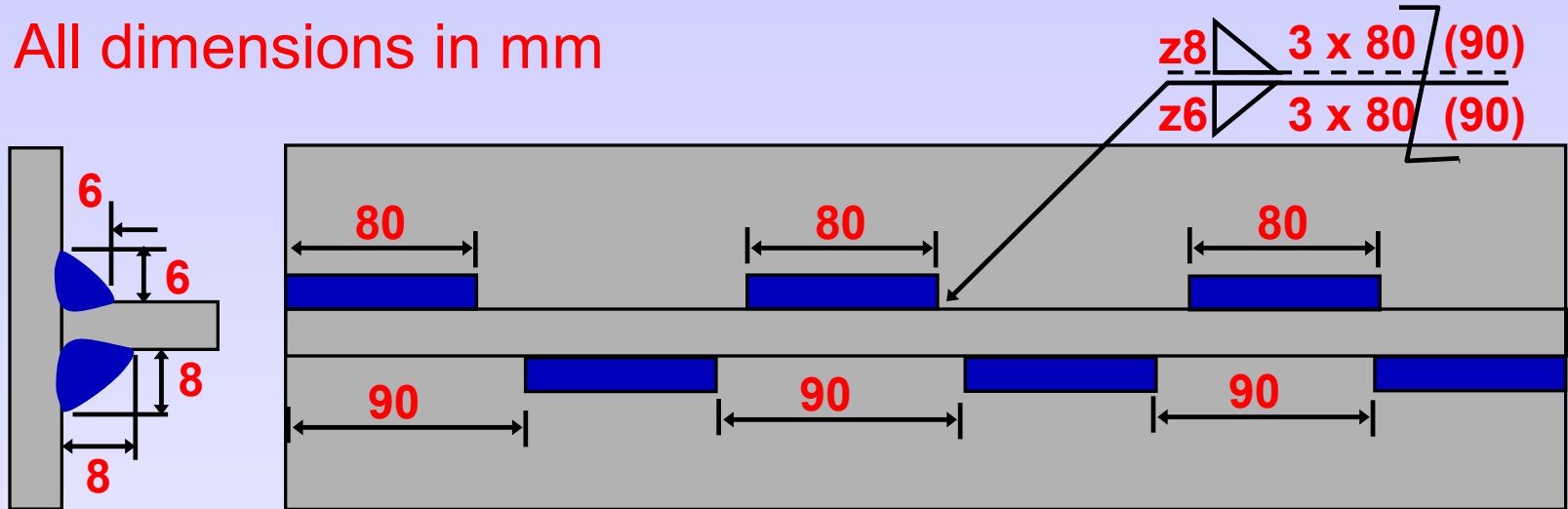


n = number of weld elements
 l = length of each weld element
 (e) = distance between each weld element
 = Weld to be staggered

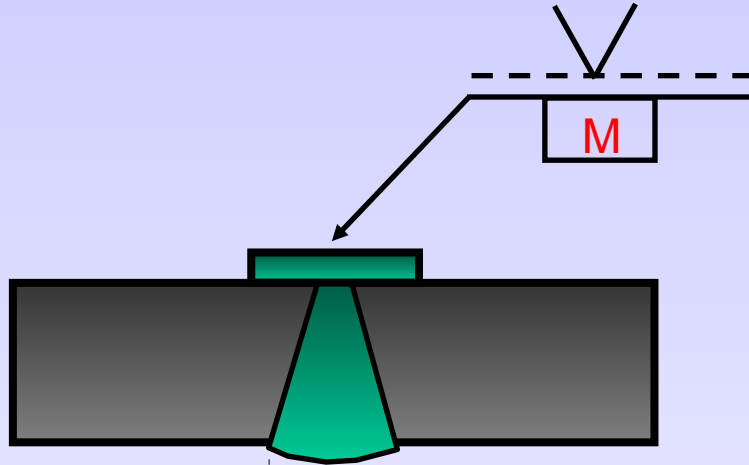


BS EN 22553. Welding Symbols

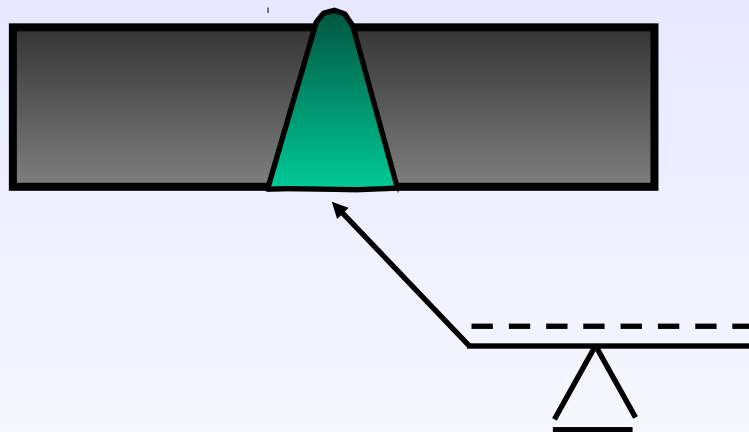
All dimensions in mm



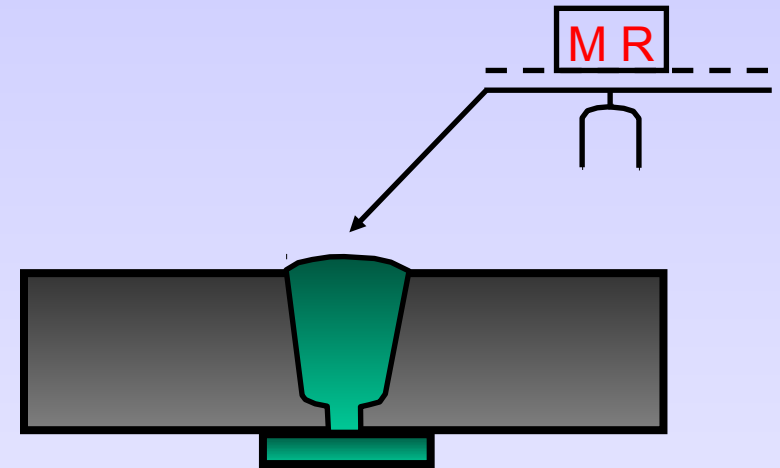
BS EN 22553 (ISO 2553) Welding Symbols



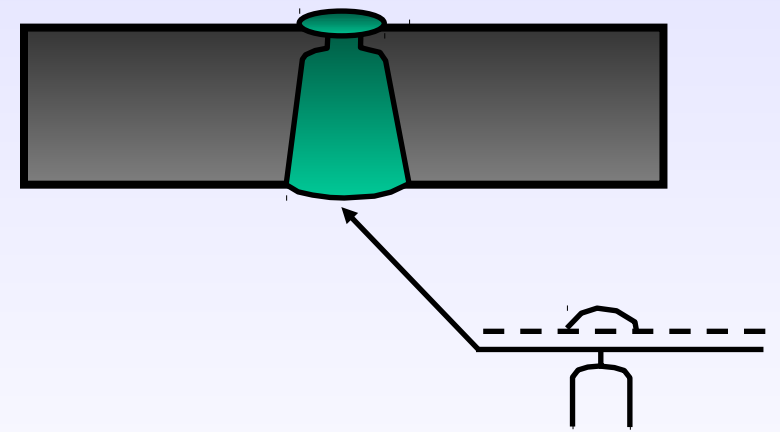
Single-V Butt with permanent backing strip



Single-V Butt flush cap

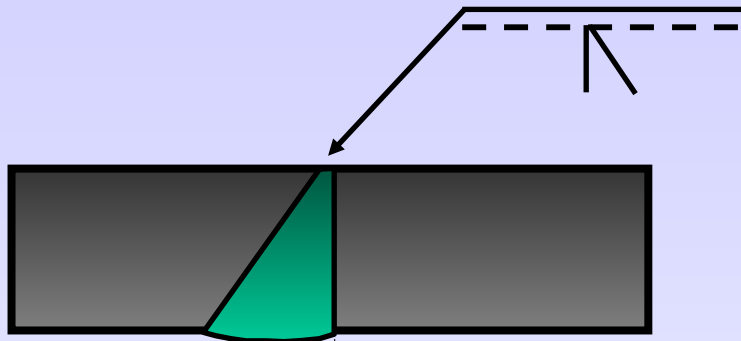


Single-U Butt with removable backing strip

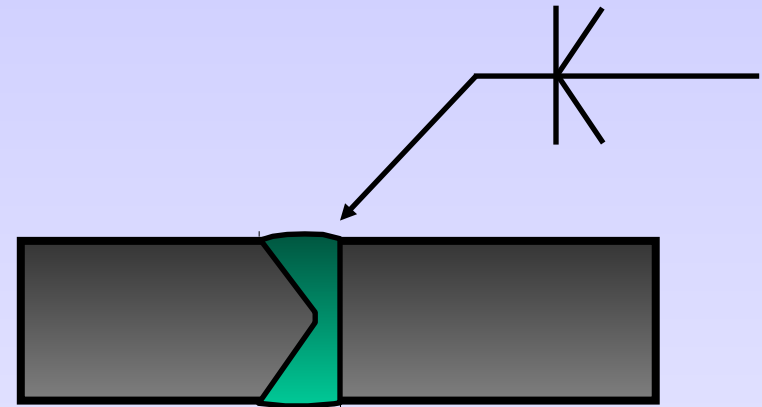


Single-U Butt with sealing run

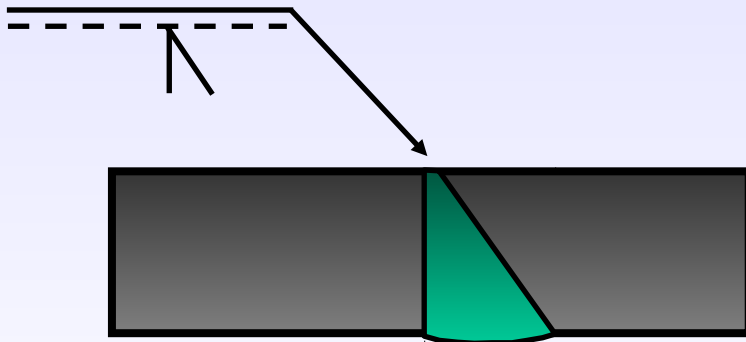
BS EN 22553 (ISO 2553) Welding Symbols



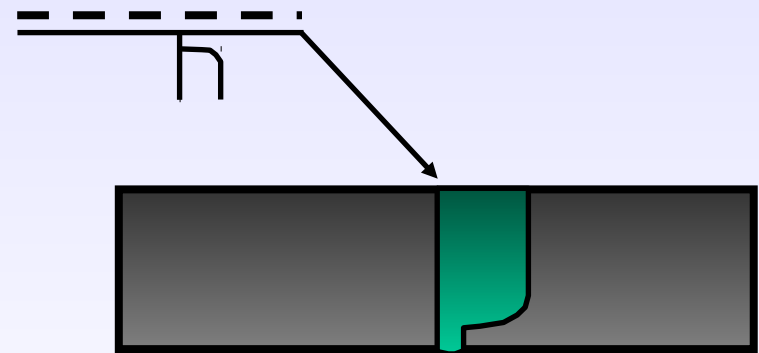
Single-bevel butt



Double-bevel butt

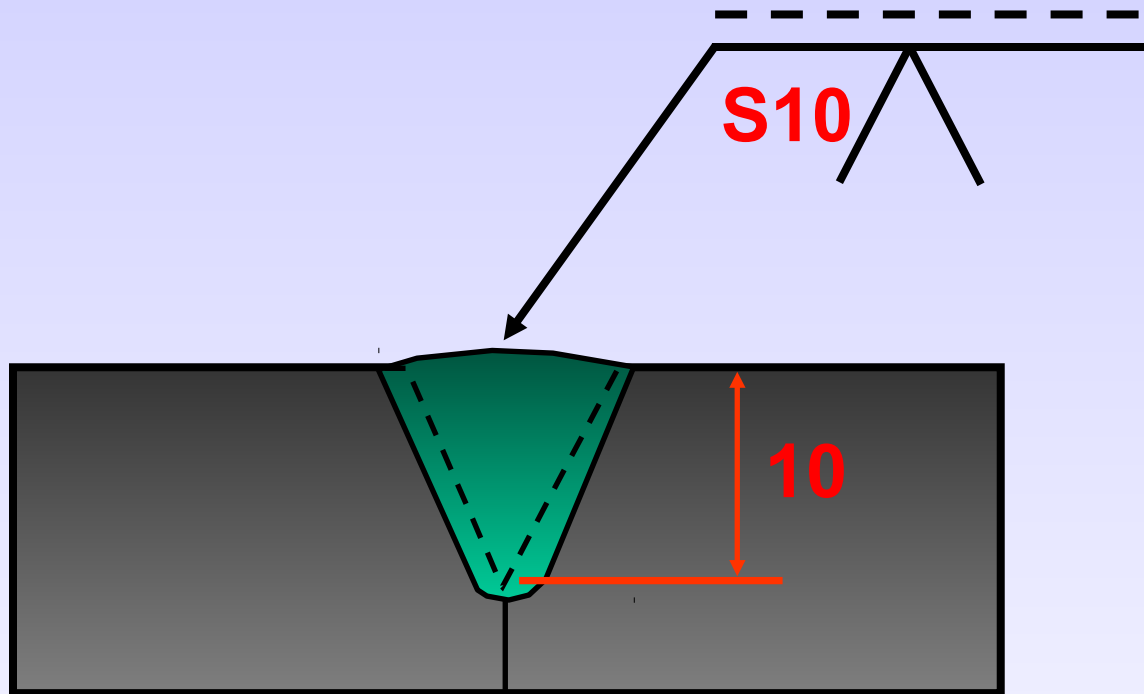


Single-bevel butt



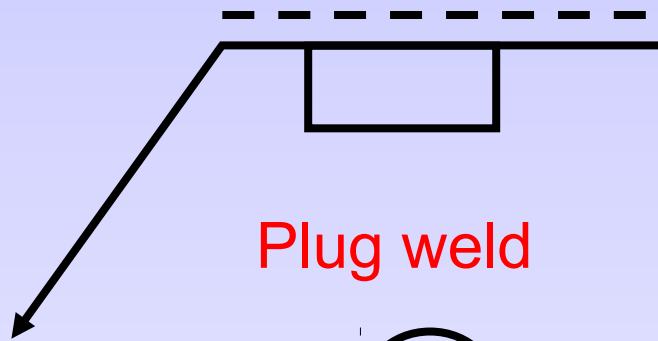
Single-J butt

BS EN 22553 (ISO 2553) Welding Symbols

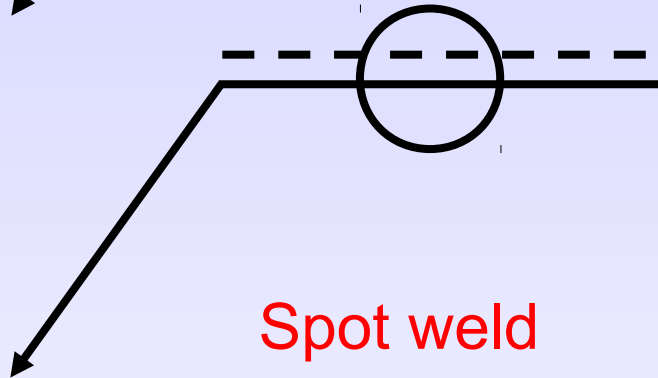


Partial penetration single-V butt

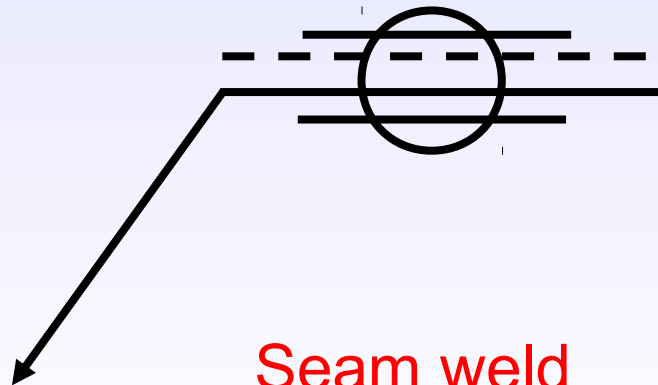
BS EN 22553 (ISO 2553) Welding Symbols



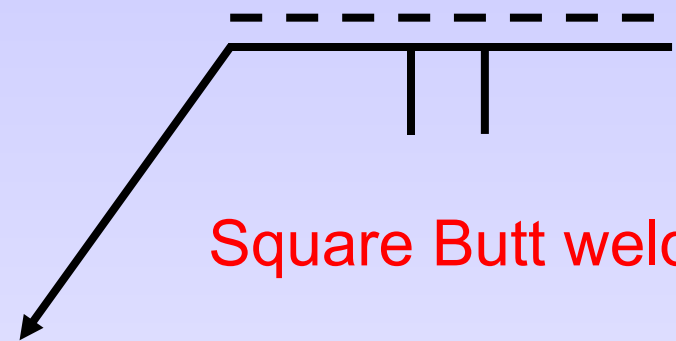
Plug weld



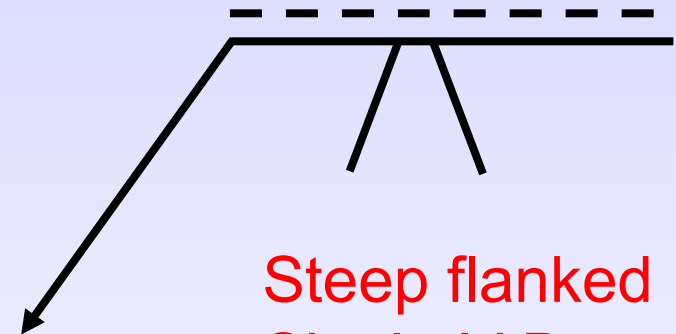
Spot weld



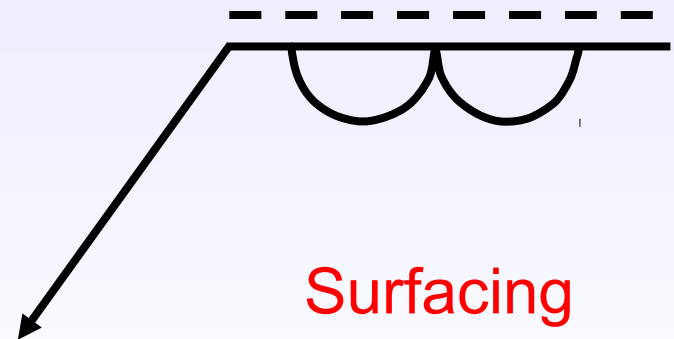
Seam weld



Square Butt weld

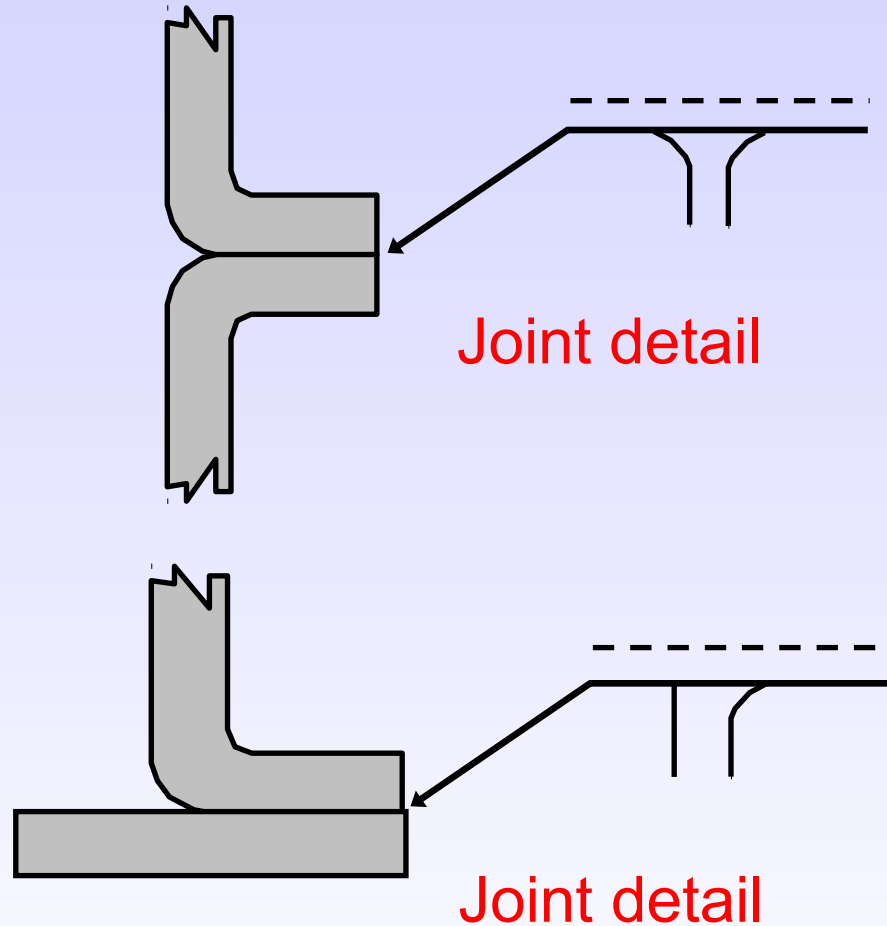
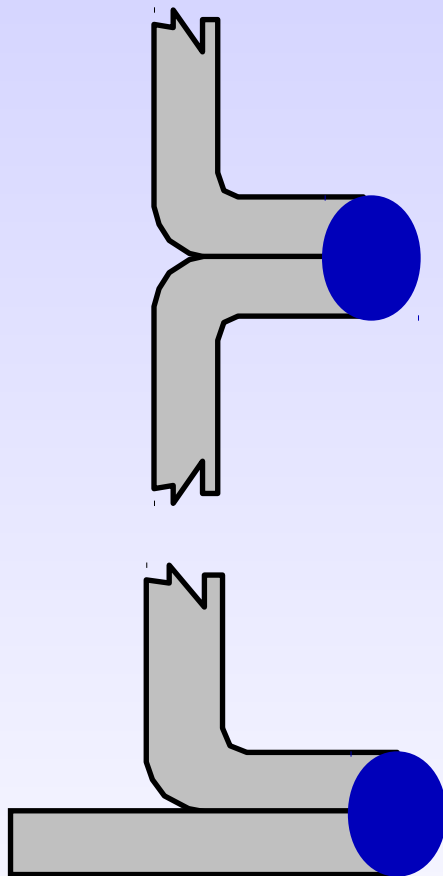


Steep flanked
Single-V Butt



Surfacing

BS EN 22553. Flared flange Welding Symbols



BS EN 22553. Numerical Indication of Process

111: MMA welding with covered electrode

121: Sub-arc welding with wire electrode

131: MIG welding with inert gas shield

135: MAG welding with non-inert gas shield

136: Flux core arc welding

141: TIG welding

311: Oxy-acetylene welding

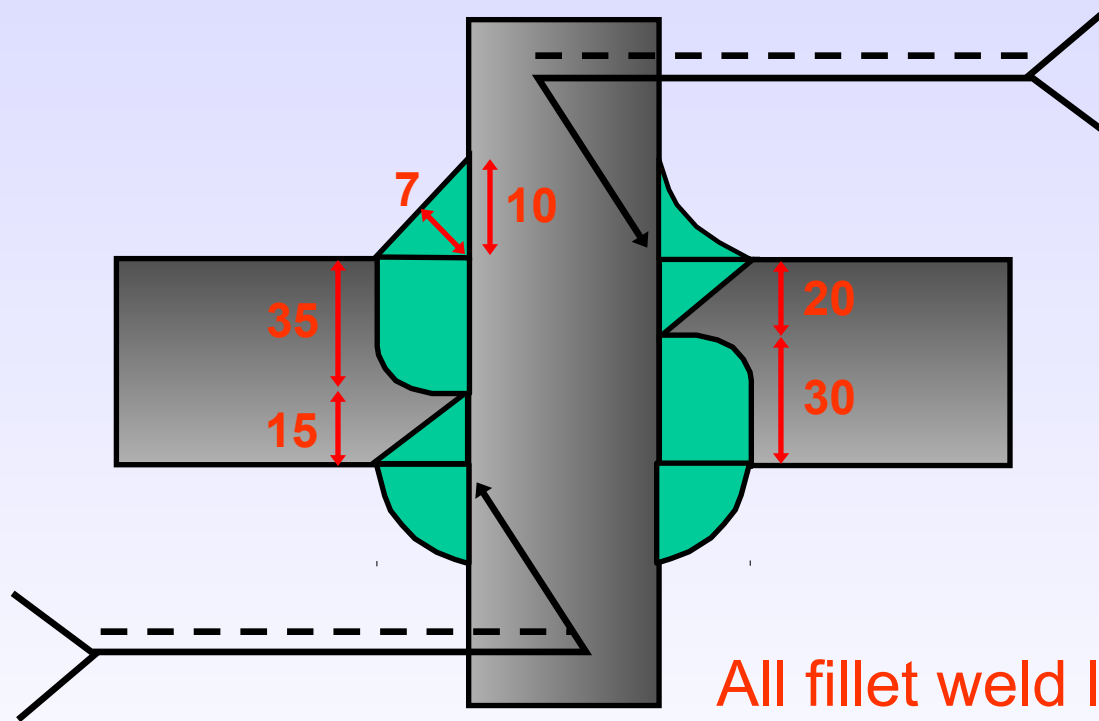
72: Electro-slag welding

Any Questions?

BS EN 22553: Butt Weld ex: 2

Complete the symbol drawing for the welded cruciform joint provided below

All welds are welded with the MIG process and fillet welds with the MMA process

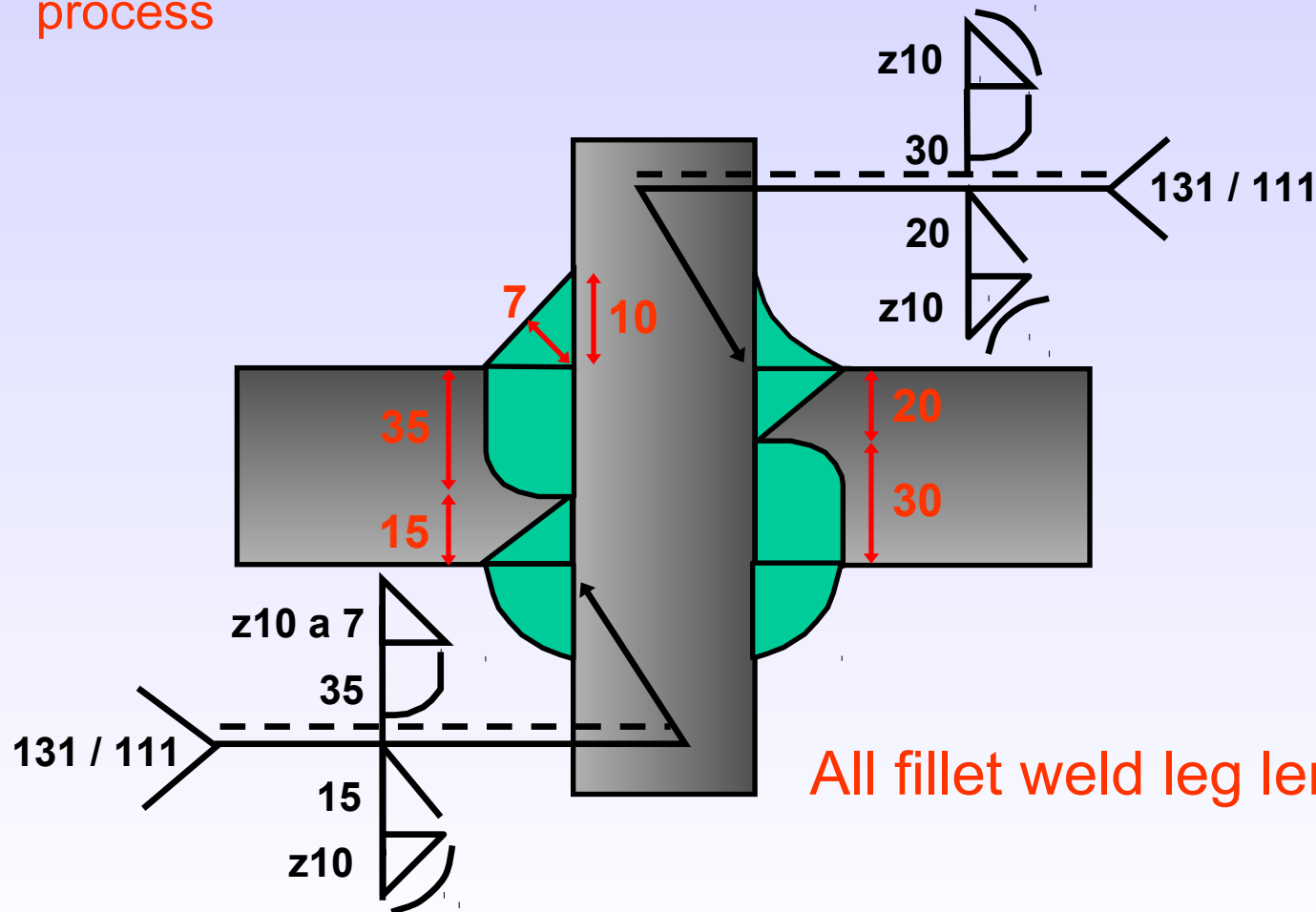


All fillet weld leg lengths 10 mm

Ans BS EN 22553: Butt Weld ex: 2

Complete the symbol drawing for the welded cruciform joint provided below

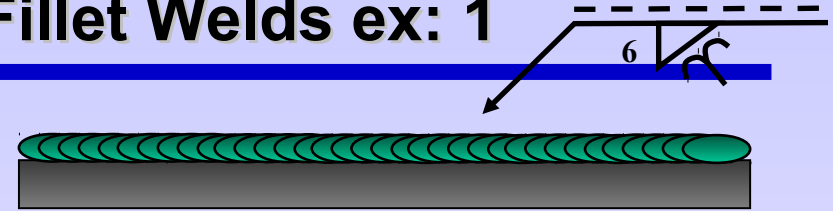
All welds are welded with the MIG process and fillet welds with the MMA process



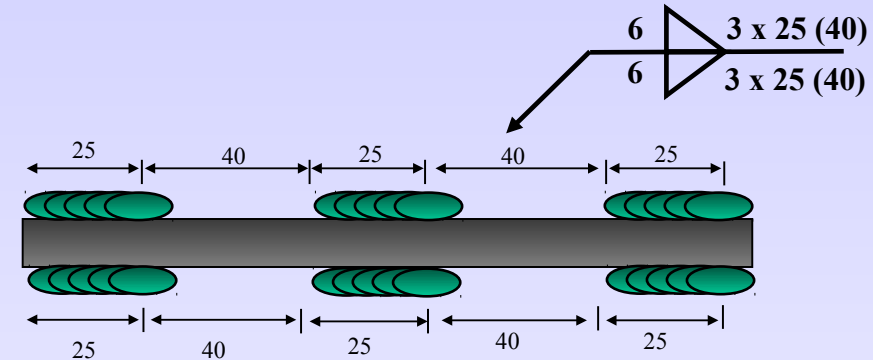
All fillet weld leg lengths 10 mm

Ans to BS EN 22553 Fillet Welds ex: 1

1. **Welded arrow side:** A continuous fillet weld with a 6 mm leg length, toes to be blended smoothly.

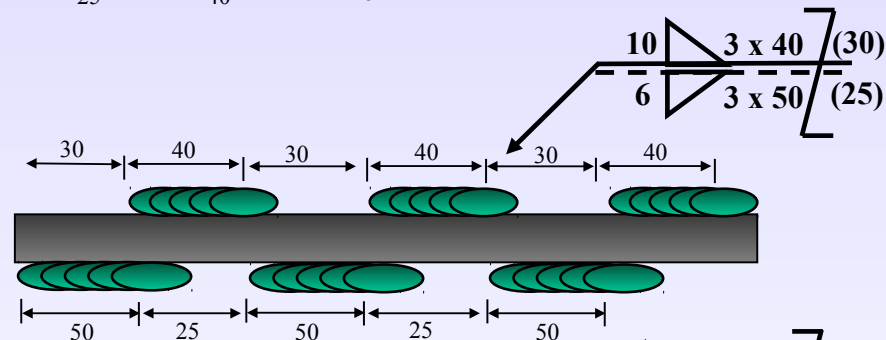


2. **Welded both sides:** Three intermittent fillet welds with 6 mm leg lengths, the length of each weld 25 mm and the distance between each weld 40 mm.



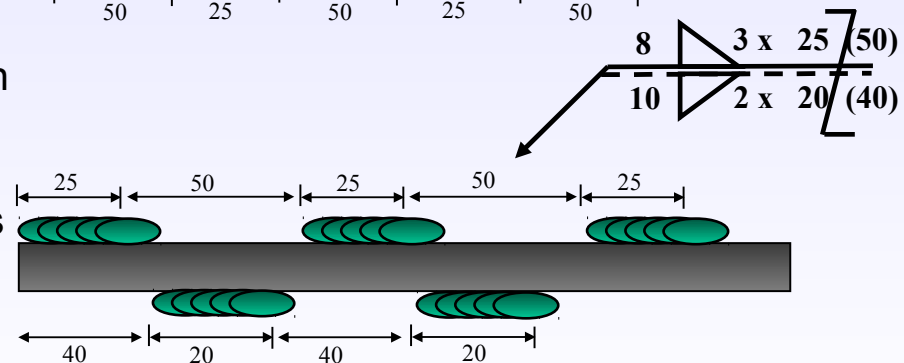
3. **Welded arrow sides:** Three intermittent fillet welds with 10 mm leg lengths, the length of each weld 40 mm, the distance between each weld 30mm.

Welded other side: Three intermittent fillet welds 6 mm leg lengths, the length of each weld 50mm and the distance between each weld 25mm, welds to be staggered.



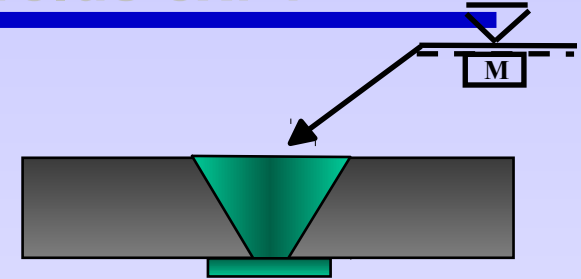
4. **Welded arrow side:** Three intermittent fillet welds with 8 mm leg lengths, the length of each weld 25 mm and the distance between each weld 50 mm.

Welded other side: Two intermittent fillet welds with 10 mm leg lengths, the length of each weld 20 mm and the distance between each weld 40mm, welds to be staggered.

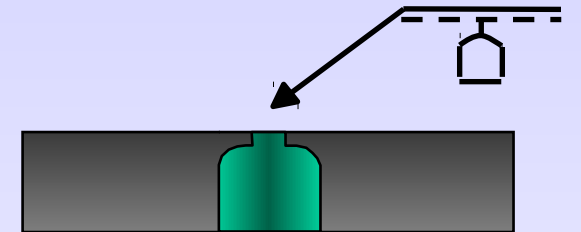


Ans to BS EN 22553 Butt Welds ex: 1

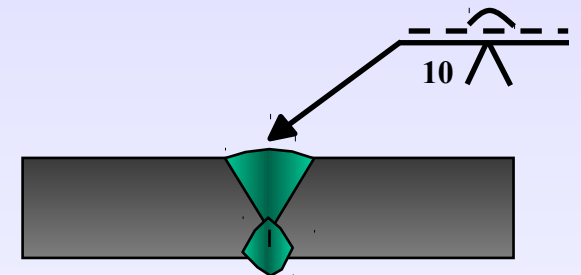
1. **Welded arrow side:** Single-V butt weld with permanent backing strip, flat weld profile.



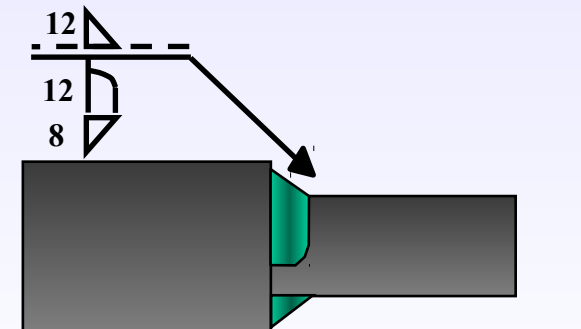
2. **Welded other side:** Single-U butt weld, flat weld profile



3. **Welded arrow side:** Single-V butt weld depth of preparation 10 mm
Welded other side: Backing run. (Plate thickness 15 mm.)

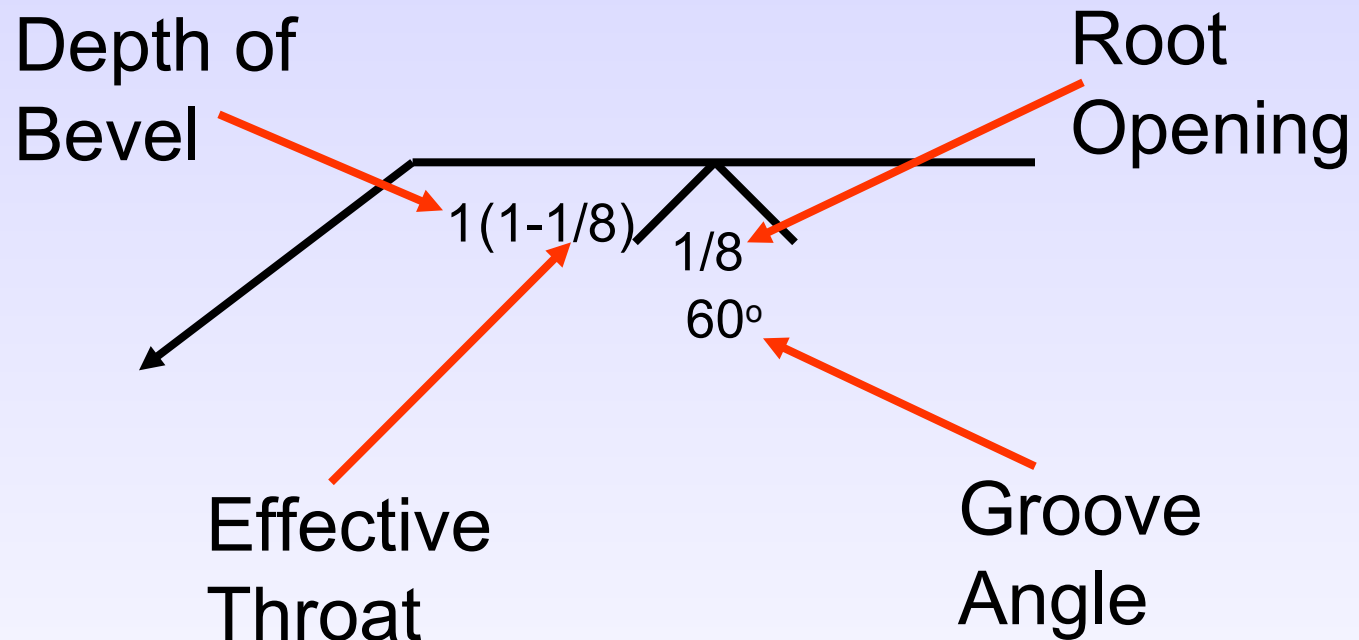


4. **Welded arrow side:** Single-J butt weld, depth of preparation 12 mm with a 8 mm fillet weld superimposed. (plate thickness 15 mm.)
Welded other side: 12 mm leg length fillet weld.



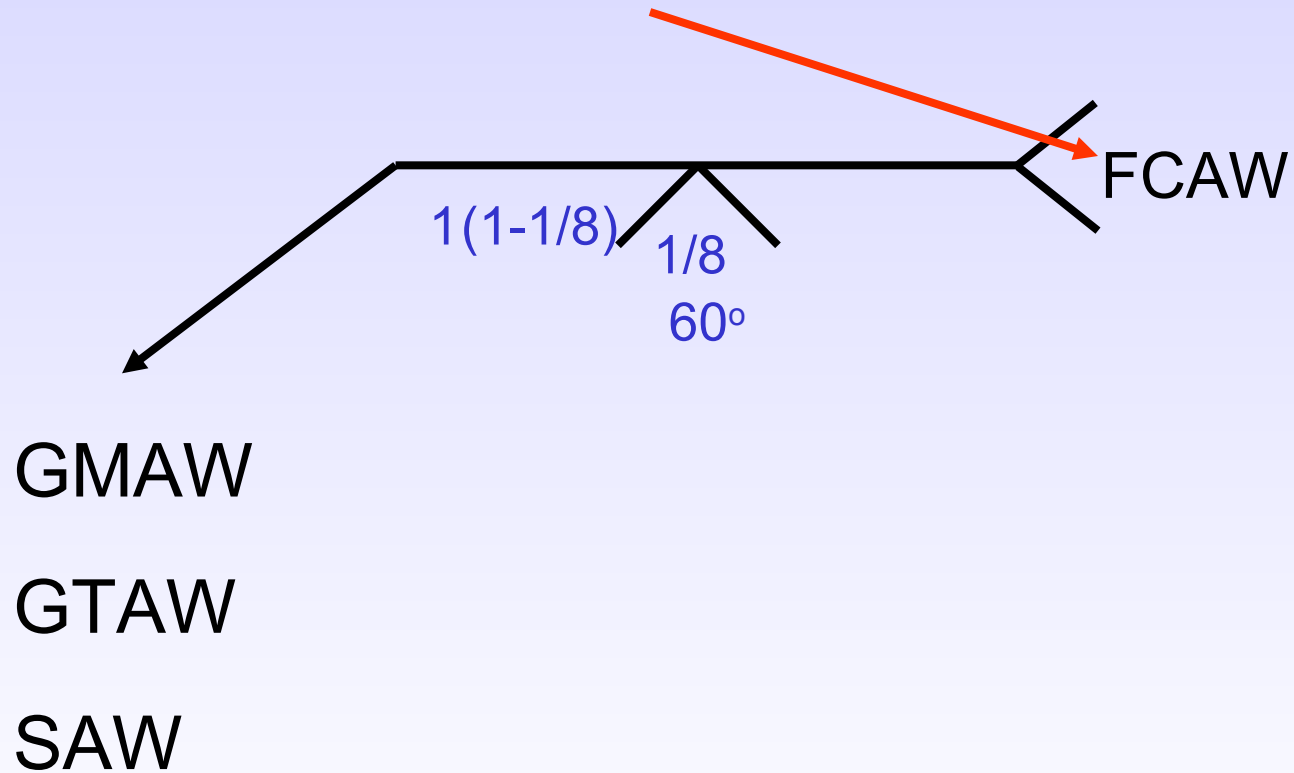
AWS Welding Symbols

AWS. Welding Symbols

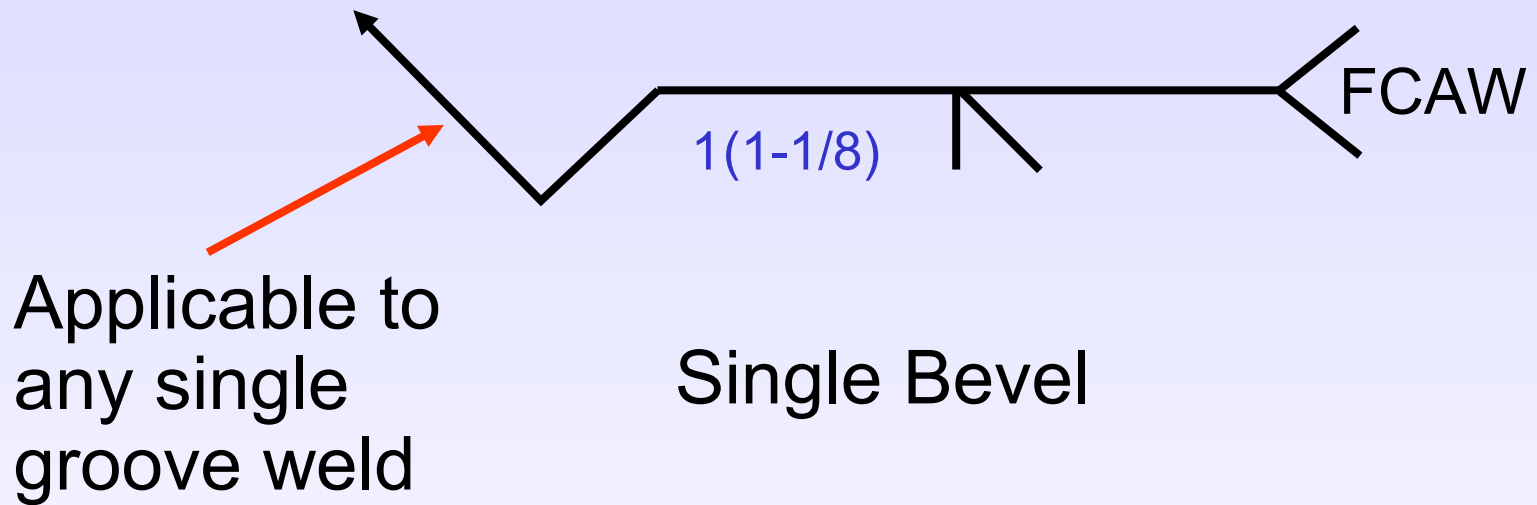


AWS. Welding Symbols

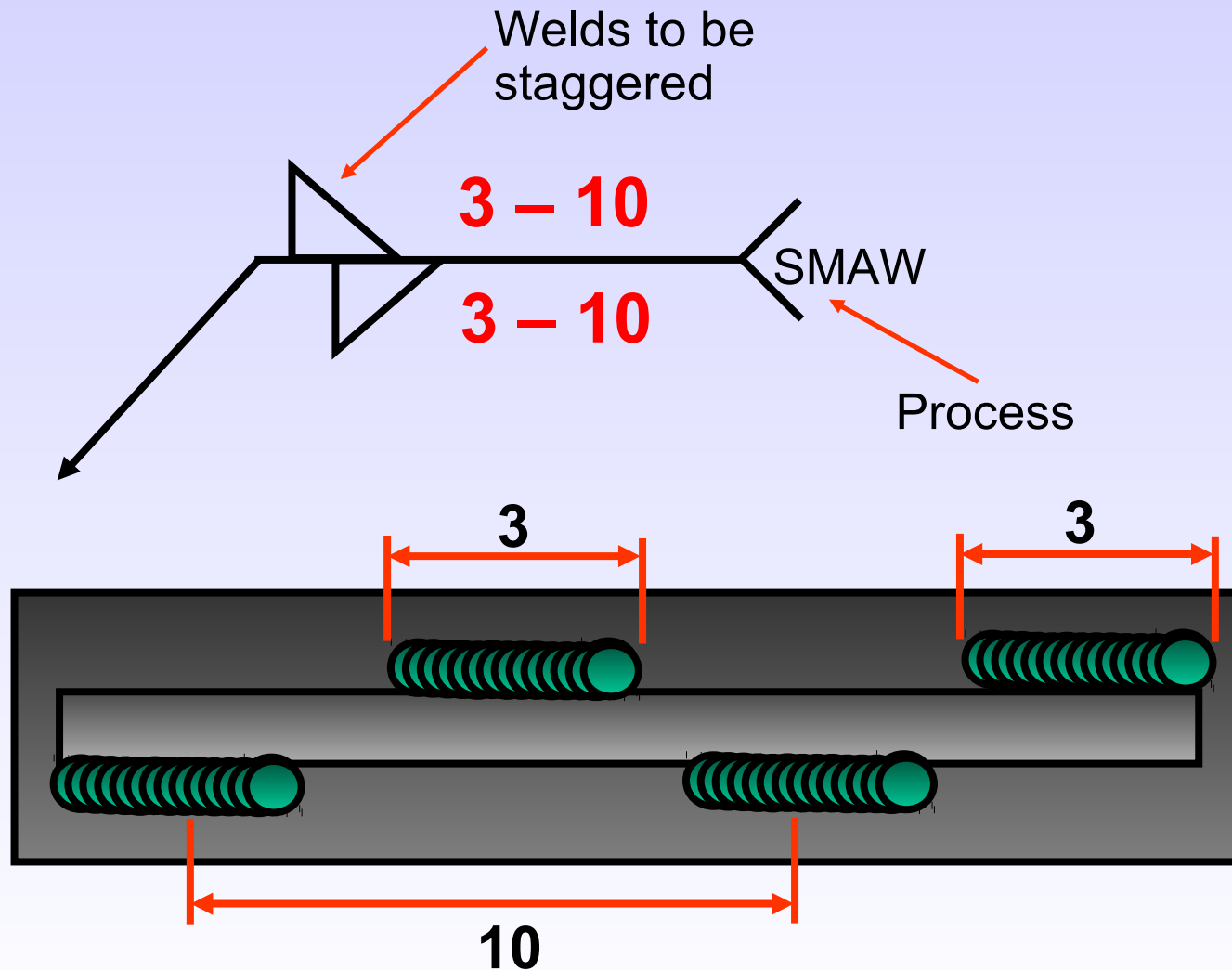
Welding Process



AWS. Welding Symbols

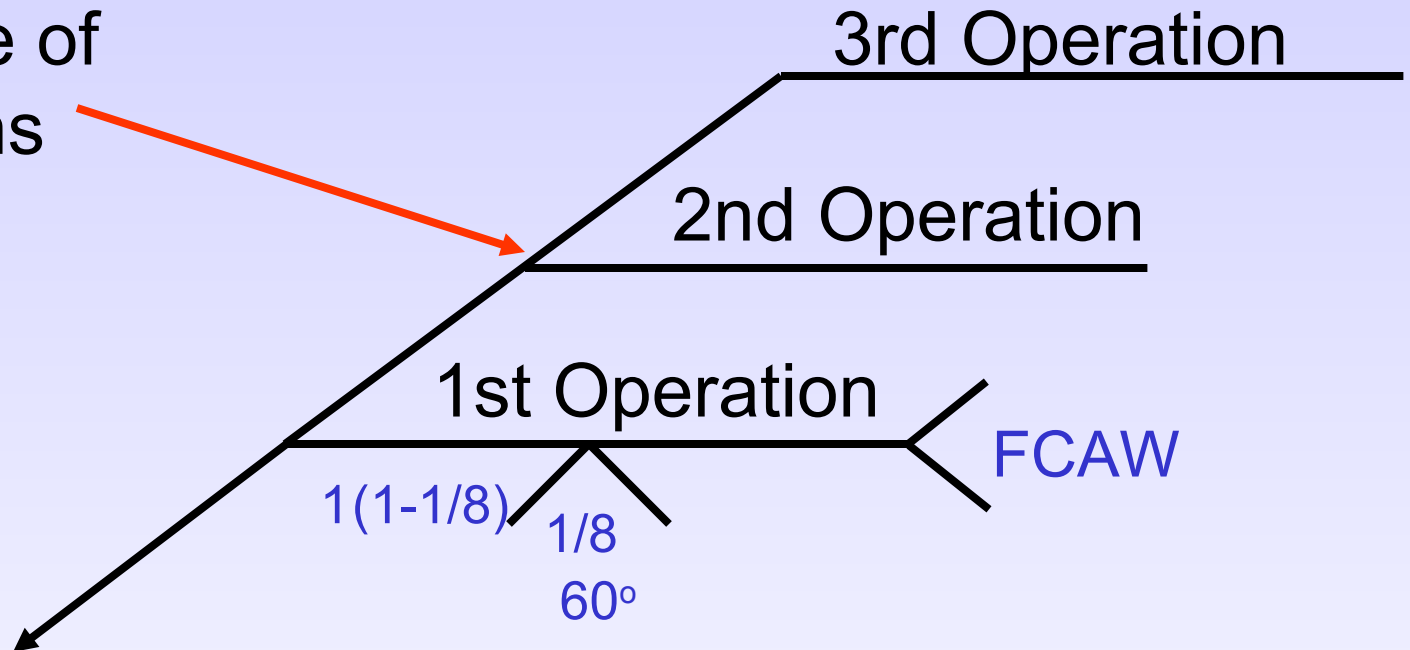


AWS. Welding Symbols



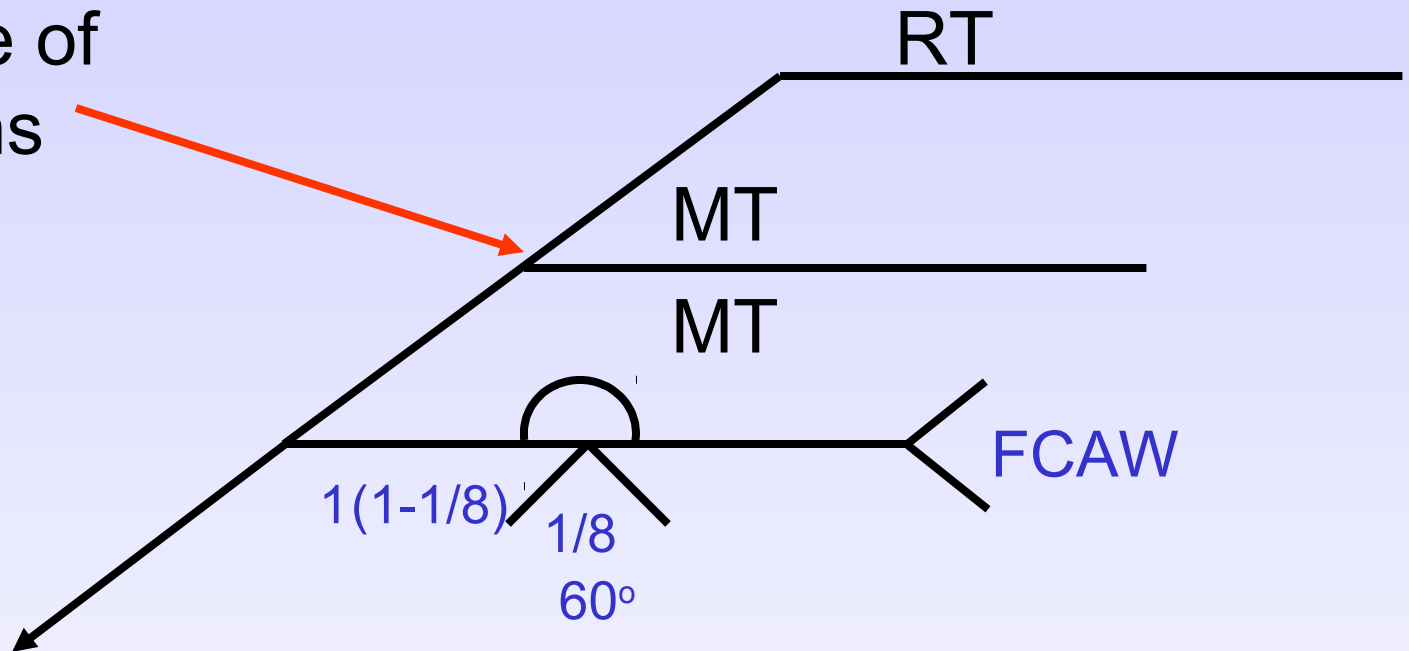
AWS. Welding Symbols

Sequence of Operations



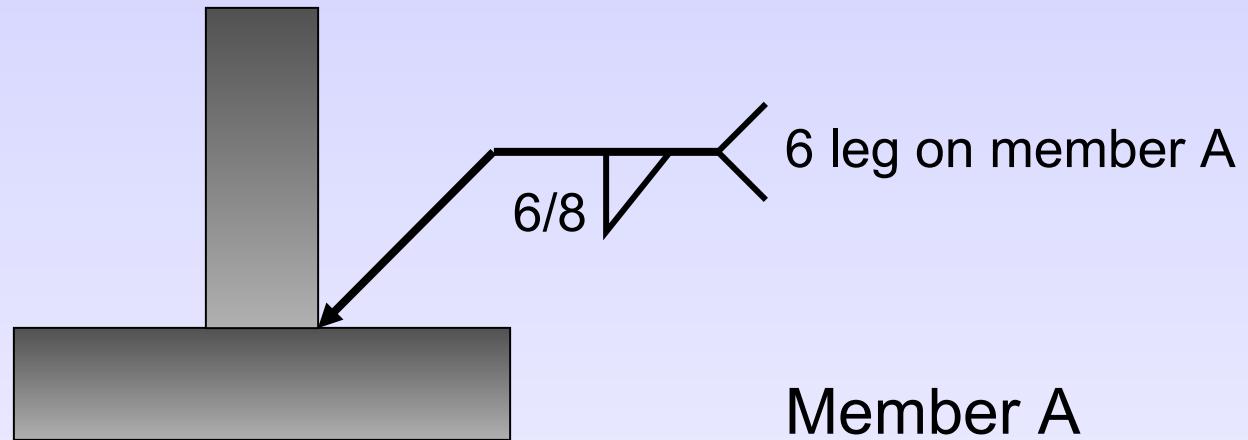
AWS. Welding Symbols

Sequence of Operations



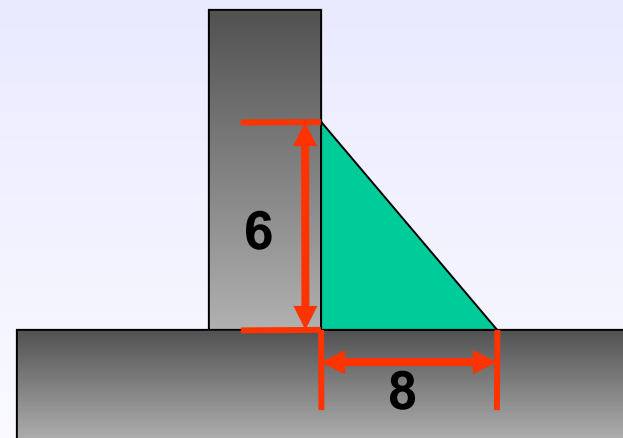
AWS. Welding Symbols

Dimensions- Leg Length



=

Member B



Member A

Any Questions?