



Industrial Technology Virtual Learning

CTE

May 15th, 2020



Machine Technology 1

Welds and welding Joints

May 15th, 2020

Objective: Identify different types of welded joints. Describe the properties of the joints.
Identify different types of welds

Types of Welded Joints

- Butt joint
- Corner joint
- Edge joint
- Lap joint
- T joint

Square Butt Joints

- Used to butt weld light sheet metal.
- 1/16 to 3/16 thick metal.

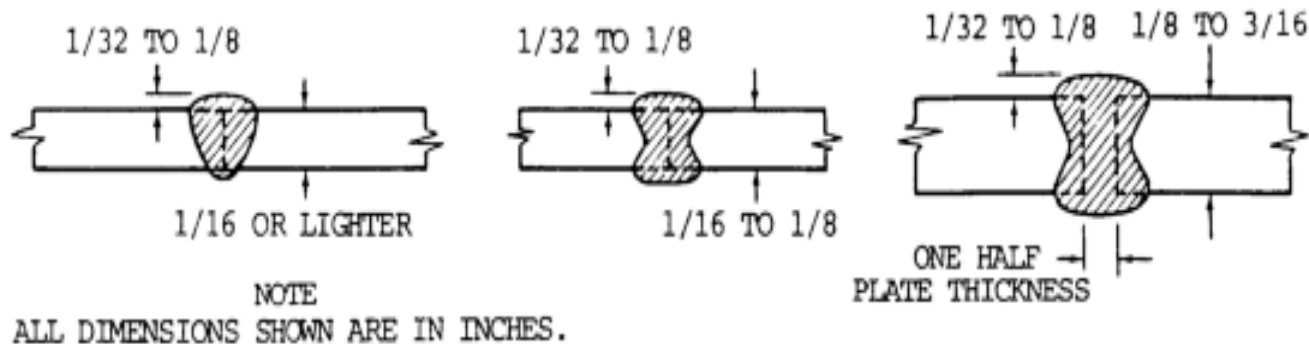
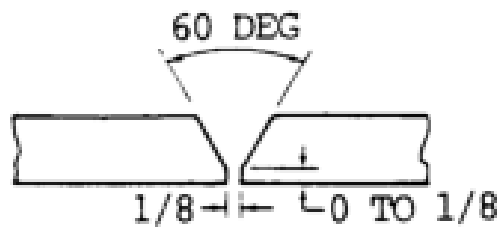


Figure 6-17. Butt joints in light sections.

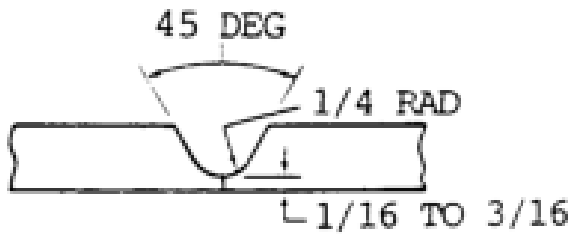
Beveled Butt Joints

- Used to butt weld heavier pieces of metal together.
- $\frac{3}{8}$ to $\frac{1}{2}$ inch metal can be welded using a single V or U joint.
- $\frac{1}{2}$ Inch metal and up can be welded using a double V or U joint.

Beveled Cont.



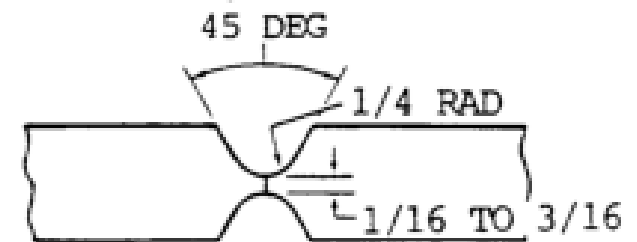
A - SINGLE - V



C - SINGLE - U



B - DOUBLE - V



D - DOUBLE - U

Figure 6-18. Butt joints in heavy sections.

Corner Joints

- Used to join two pieces of metal that are approximately right angles to each other.
- Closed corner joint is used on light sheet metal where strength is not a requirement at the joint.
- Half open corner joint is used on heavier metal when welding can only be done on one side. Used when load is not severe.

Corner Cont.

- Open corner joint is used on heavy material. It is the strongest of the corner joints.
- Corner joints on heavy material are welded on both sides. The outside first then reinforced on the inside

Corners Cont.

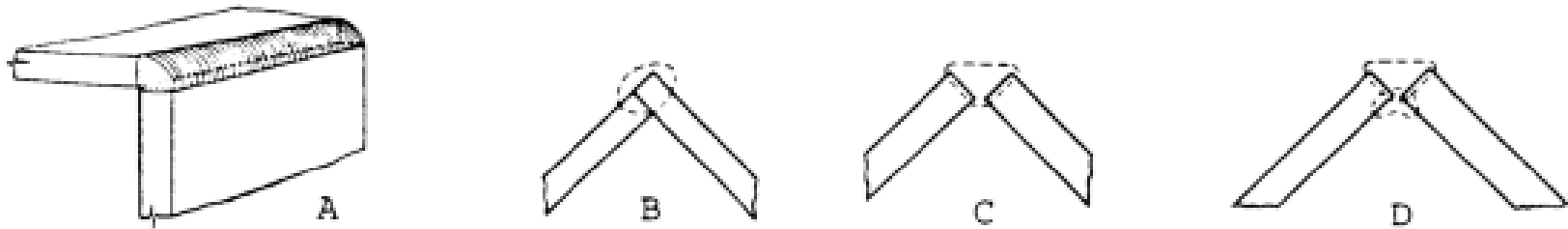


Figure 6-19. Corner joints for sheets and plates.

Edge Joints

- Used to join two parallel or nearly parallel pieces of metal. Not very strong.
- Used mainly to join edges of sheet metal, reinforce flanges of I beams, and mufflers

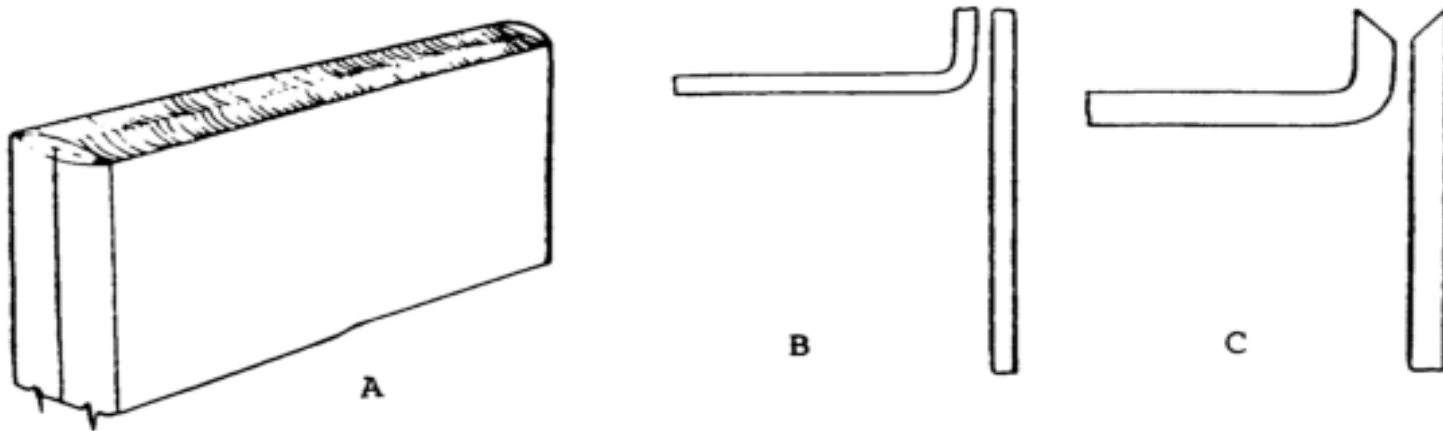


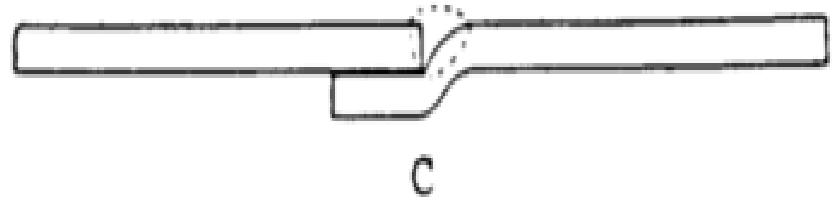
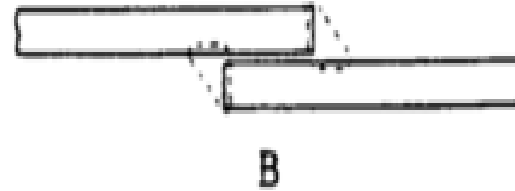
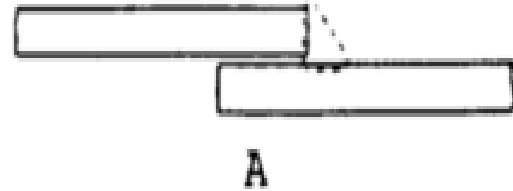
Figure 6-20. Edge joints for light sheets and plates.

Lap Joints

- Used to join two overlapping pieces of metal.
- Single lap joint welded from one side.
- Single lap joint welded from two sides develops full strength.
- Off set lap joint is used when two pieces of metal need to be joined in the same plain.

Lap Joints Cont.

- A- single lap joint, one weld.
- B- single lap joint, two welds.
- C- offset lap joint.



Tee Joints

- Used to join two pieces of metal that are approximately 90 degrees to each other, but the surface of one piece of metal is not in the same plane as the other metal.

Tee Joints Cont.

- A- plain tee
- B- single beveled
- C- double beveled
- D- single J
- E- double J

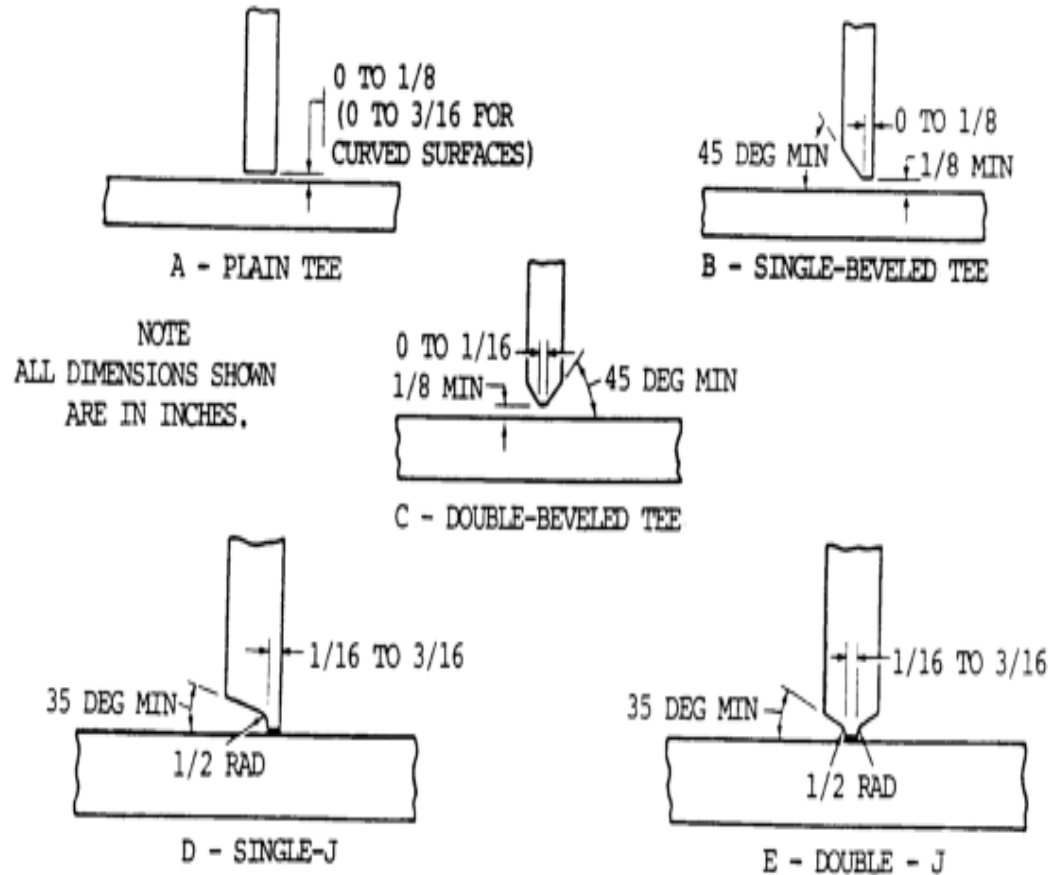


Figure 6-23. Edge preparation for tee joints.

Types of Welds

1. **Fillet weld**(pronounced fil-et)- basic weld used. Used when joining two pieces of metal without preparing the surface of the metal first.
- **Groove weld**- basic weld, used when preparing the metal before welding it into place.

Fillet Welds

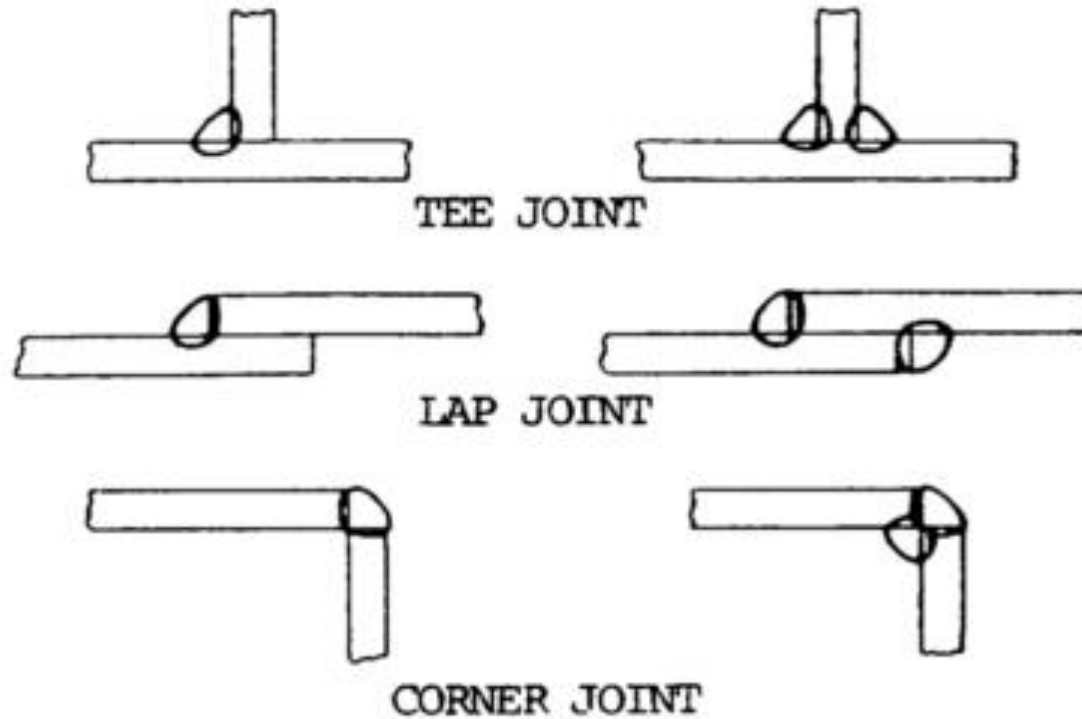


Figure 6-24. Applications of fillet welds--single and double.

Groove Welds

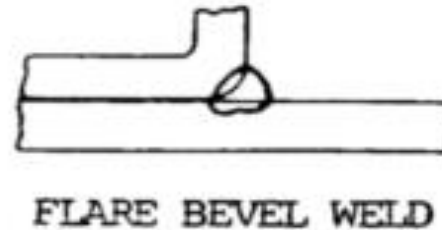
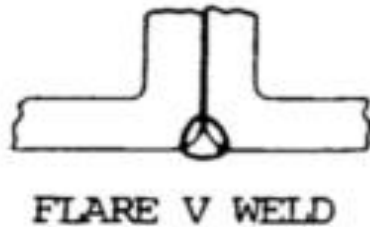
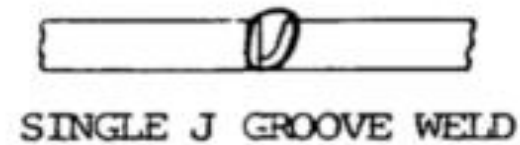
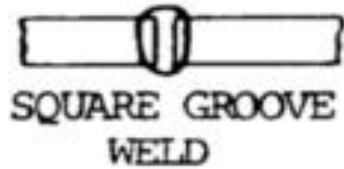


Figure 6-25. Basic groove welds.

Review

- What are the types of joints?
- on a Tee joint the pieces should be at what angle to each other?
- What is the difference between a fillet and a groove weld?

- What is the strongest of the corner joints?
- Name the two types of welds we will use?