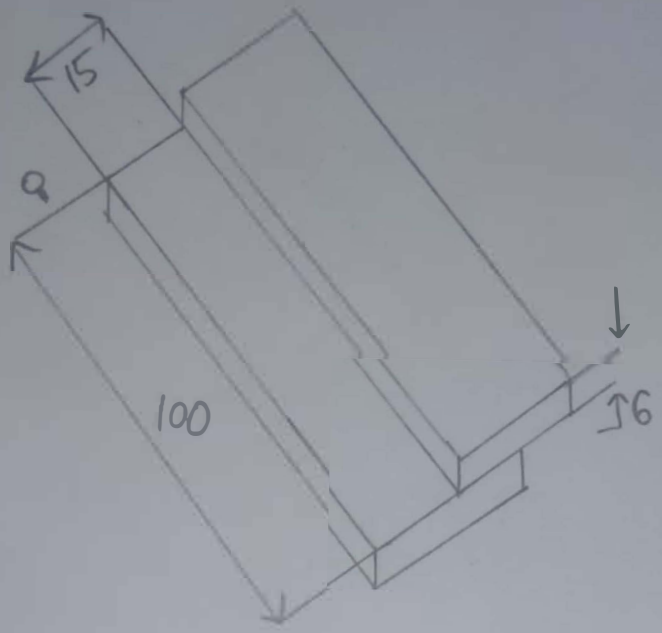
EXP: 2B

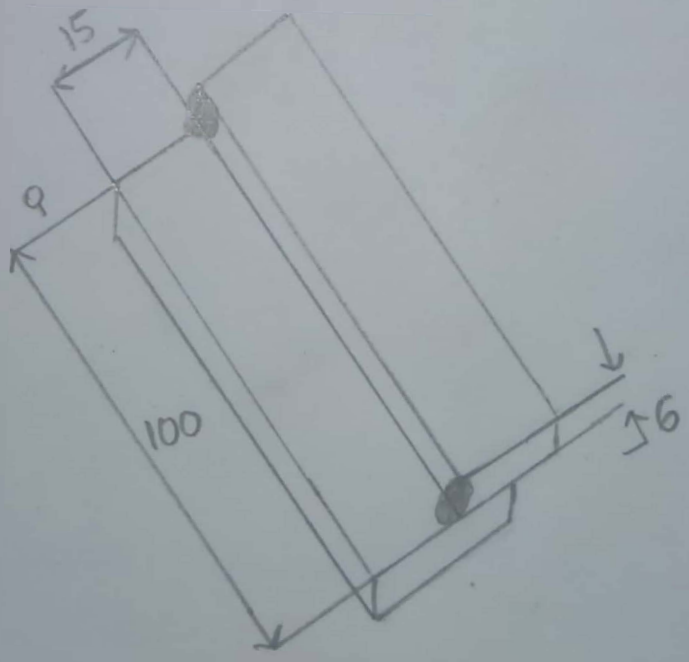
ELECTRICAL ARC WELDING

LAP JOINT

(1) Preparation



(2) Tack weld



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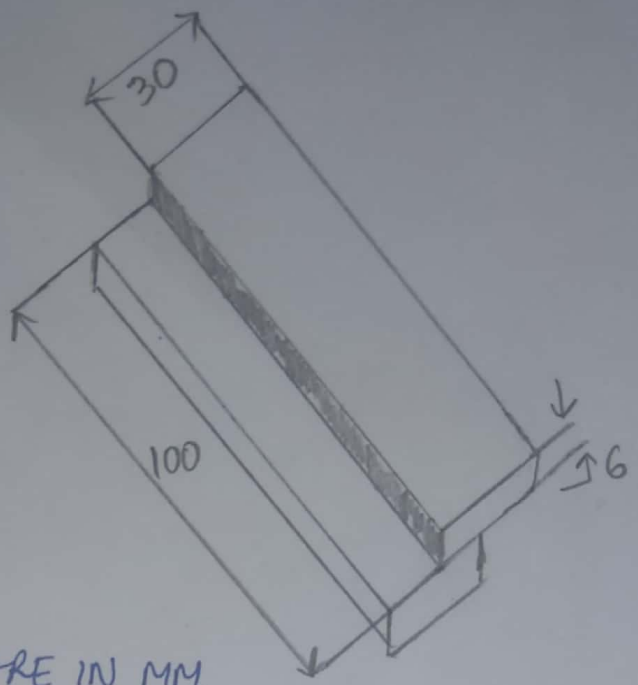
(3) Final Weld



ALL DIMENSIONS ARE IN MM.
(100x30x6)

★ **AIM:**

To join two edges of metal pieces overlapping each other using arc welding method.

★ **APPLICATION:**

Lap joint is used in very heavy structures, constructions and steel furniture using arc welding method.

★ **TOOLS REQUIRED:**

(1) Bench vice (2) Try square (3) Steel rule (4) Flat file (5) Chipping hammer (6) Wire brush (7) Tongs (8) Welding sheild.

★ **EQUIPMENT REQUIRED:**

(1) Electrical arc welding machine. (2) Arc welding cable (3) Ground clamp.

★ **SAFETY EQUIPMENT:**

(1) Leather apron (2) Hand gloves (3) Googles.

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★ SEQUENCE OF OPERATION:

(1) Preparing (2) Tack welding (3) Final welding
(4) Chipping and Cleaning.

★ WORKING STEPS:

(1) Preparing:

→ Clean the edges of the work pieces using wire brush to remove dust and rust.

→ Check the dimensions using steel rule and also check the straightness of the edges to be joined using try square.

→ File those edges using flat file and make them straight. Once again check with try square.

(2) Tack welding:

→ Keep one work piece over welding table place another pieces over the first one so that the field edges make overlap of 15mm as shown. With the help of tongs hold the work piece in position.

→ Check the welding machine electrode cable and clamp for proper connection. Select correct electrode (3.15mm) and fix it in electrode holder. Use gloves while fixing the electrode.

→ Switch on welding machine. Adjust the current to 100 amps. Keep the shield closer to eyes and move the electrode nearer to one end of the work piece pair. A critical distance should be maintained to produce spark. Make a spot over the work piece.

→ The same way make another spot at the next end of work piece pair. This is to keep the pieces in place during welding.

→ Turn the work pieces upside down and make tack weld at required places.

(3) Final Welding:

→ Move the electrode to first tack and make a spark.

→ Gradually move the electrode towards the second tack without shaking the electrode and maintain

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the gap between electrode tip and work piece is called as first run.

→ For the second run from first tack and move towards second tack with uniform oscillation motion. This keeps the metal molten a little longer and allows the gas to escape, bringing the slag to the surface.

(4) Chipping and Cleaning:

→ Allow the work piece to cool and dip it in water using tongs.

→ With the help of chipping hammer gently tap the welding bead so that the slag coating is removed from the work pieces.

→ Clean the work piece with wire brush thoroughly.

→ Check for the dimensions.

★ PRE LAB QUESTIONS:

Q1. Which one of the following transformer used in AC arc welding??

Ans= Step down transformer is used in AC arc welding.

Q2. What is welded joint? Its permanent or temporary joint?

Ans= The joint is made by reducing the work piece temperature to that of the room temperature. It is a permanent joint where the metals are melted and with the aid of a filler material a weld pool is created which is nothing but a puddle of molten metal.

Q3. Name the components equipment's and tools used.

Ans= (1) Mild steel metal plates of dimension 100 mm x 30 mm x 6 mm (2 pieces)
(2) Bench vise (2) Try square (3) Steel rule (4) Flat file (5) Chipping hammer (6) Wire brush (7) Tongs (8) Welding shield.

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Q4. How does an electrode work?

Ans= The contact between the rod/electrode and work piece ignites the arc. This creates a short circuit for a fraction of a second between the two poles, meaning that current can then flow. The arc burns between the workpiece and the electrode. This creates the required fusion heat.

Q5. Why the step down transformer used for welding purposes?

Ans= High amount of current is needed to produce arc and at the time of arc formation voltage is very low as transformer is a constant power device, so when step down transformer step down the voltage by the turn ratio by the same turn ratio current is step up as $P = VI$ is constant.

Q6. What is arc welding and mention the required weld temperature is given by?

Ans= Arc welding is a technique in which metals are welded using the heat generated by an electric arc. The temperature ranges from a minimum 3000 degrees centigrade to up to 20000 degree centigrade.

Q7. Why travel speed is important in welding?

Ans= Weld penetration into a base material is increased, when the travel speed of a weld is increased and vice versa. At slower travel speeds, the arc is directly above the center of the molten weld pool.

Q8. List out material to be used in arc welding.

Ans= (1) Steel and stainless steel (2) Aluminium (3) Titanium (4) Cast iron (5) Copper and Brass (6) Magnesium alloy.

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Q9. Which of the following is a holding tool?

Ans= (1) Bench vice (2) Work bench (3) Pipe vice (4) Hand vice (5) Tool makers vice.

Q10. How do you use try square tool?

Ans= The thicker part of the handle should extend over the edge of the surface, allowing the blade to lie flat across the surface. Hold the handle against the edge of the material. The blade should be positioned at a 90° angle compared to the edge.

* RESULT:

Thus the given two plates are joined by Lap joint using arc welding method.

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