ELECTRICAL ARC WELDING
LAP JOINT

Experiment No. 2(B)
DATE: 29/09/2021

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

Material specification
Mild steel plate of dimension 100mm × 30mm × 6mm – Two pieces.

Tools Required
1) Bench vice 2) Try square 3) steel rule 4) flat rule 5) chipping hammer
6) wire brush 7) Tongs 8) Welding shield

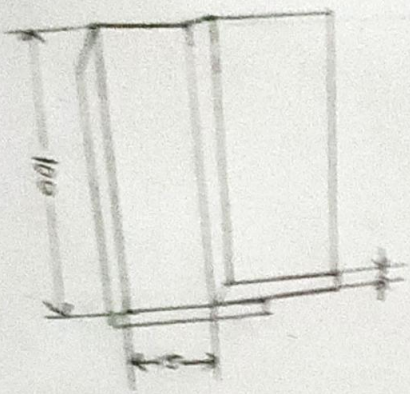
Equipment Required
1) Electrical arc welding machine 2) Arc welding cable 3) Ground clamp

Safety equipment
1) Leather apron 2) Hand gloves 3) Goggles

Sequence of operation:
1) Preparation 2) Tack welding 3) Final welding 4) chipping & cleaning

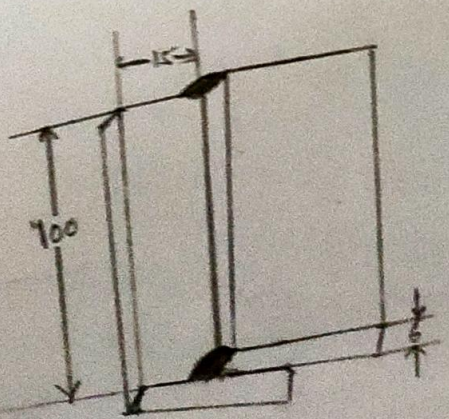
WORKING STEPS:
Preparation

1) clean the edges of the work pieces using wire brush to remove dust and rust
2) Check the dimensions using steel rule and also check the straightness of the edges to be joined using try square
3) Fill those edges using flat file and make them straight. Once again check with try square.



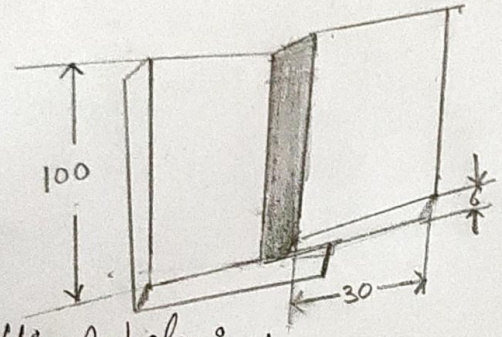
Tack Welding

1) Keep one work piece over welding table, place another piece over the first one so that the field edges make a overlap of 15mm as shown. With the help of tongs hold the work piece in position
2) 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.
3) Switch on welding machine. Adjust the current to 100 amp. Keep the shield cover closer to eyes and move the electrode nearer to one end of work piece pair. Electrode should not touch the work piece. A critical distance should be maintained to produce spark. Make a spot over the work piece
4) The same way make another spot at the next end of the work piece pair. This keeps the pieces in place during welding
5) Turn the work pieces upside down and make tack weld at required places.



Final Welding

1) move the electrode to first tack and make a spark
2) Gradually move the electrode towards the second tack without shocking the electrode and maintain the gap between electrode tip and work piece (Backhand welding is preferred for thick plates) This is called as first run
3) for the second run start 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.



Chipping And cleaning:

1) Allow the work piece to cool and dip it in water using tongs
2) With the help of chipping hammer gently tap the welding bead so that the slag coating is removed from the work pieces.
3) Clean the work piece with wire brush thoroughly
4) Check for the dimensions

PRE-LAB Questions

1) Which one of the following transformer used in AC arc welding
   Step-down transformer
2) what is the welded joint? Its permanent or temporary joint
   It is a permanent joint which is obtained by heating the edges of similar metal pieces
3) list out material to be used in Arc welding
   Mild steel pieces (Two pieces) - 100mm x 30mm x 6mm
4) How does An electrode work)
   It is used to conduct current through work piece and fuse two pieces together
   It creates a circuit for current to flow

5) Why step down transformers used for welding purposes?
It is used to get high current and low voltage required for welding

POST-LAB Questions

1) what is arc welding and mention the required weld temperature is given by?
Arc welding is a fusion welding process used to join metal. A high temperature of 6500°F is required

2) Why travel speed is important in welding?
To ensure good weld and avoid defects and to force slag to top.

3) Name the components/equipments and tools used in arc welding
a) welding machine b) Electrod holder c) Tongs d) wire brush
e) chipping hammer

4) Which of the following is a holding tool
Bench vice

5) How do you use try square tool?
It is placed across the edges of the material to check 90° angles.

Result

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