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JOB-02

AIM: - To make a butt joint by mannual metal arc welding.

Objectives: - The objectives of the job are stated below

i. A brief study about welding process.
ii. To have a proper knowledge about the various tools that are used in welding process.
iii. A brief knowledge about the types of welding process.
iv. Purpose, advantages and limitations of welding.
v. To make a butt joint.

THEORY

Welding is a permanent joining process in which two similar or dissimilar metals are joined by application of heat with or without the application of pressure and with or without the use of filler metal. The heat may be generated either from combustion of gases, electric arc, electric resistance or by chemical reaction. Welding is an atomic bonding process and metallurgical bond is accomplished by the attracting forces between the atoms.

Application of Welding: It is widely used as a fabrication and repairing process in industries like fabrication of ships, pressure vessels, automobile bodies, off-shore platform, bridges, welded pipes, sealing of nuclear fuel and explosives, etc.

Purpose of Weilding

- There is no industry (except software industries) where welding activity is not to be found.

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- The strength of the joint equal and sometimes greater than the parent metals.
- Welding is one of the most extensively used manufacturing process.
- In addition, it is used for repair and maintenance.
- No industrial growth is possible without successful application of welding.

Principle of Electric Arc Welding

The source may be alternating current or direct current. The workpiece is kept on the metallic plate. One cable from power supply is connected to the electrode holder into which the electrode is gripped. Other lead is connected to the metallic table on which workpiece is kept. When the electrode is brought into contact with workpiece arc generates and welding takes place.

Electric Arc Welding

Arc welding is a fusion welding process where joining is obtained by heat produced by an electric arc. Electric energy from the arc produces temperature ~ 10,000° F (5500° C), hot enough to melt any metal. The arc may be obtained:

a) Between workpiece and consumable electrode (act as filler materials also) as in shielded metal arc welding (SMAW), metal inert gas welding (MIG welding)
b) Between workpiece and non-consumable electrode as in tungsten inert gas welding (TIG Welding).
c) Between two non-consumable electrodes as in carbon arc welding.
d) Between metal pieces which are to be welded together.

Electric arc welding is one of the most versatile joining processes and is extensively used all over the world. One of the attractive features of arc welding is ease of use and high production rate that can be achieved economically.