

WEEK: 10.

SUBJECT: BASIC TECHNOLOGY.

CLASS: JSS3.

TOPIC: SOLDERING AND BRAZING

SOLDERING AND BRAZING

Soldering is a process in which two or more items are joined together by melting and applying a filler metal into the joint, the filler metal having a lower melting point than the adjoining metals. Unlike welding, soldering does not involve melting the work pieces.

Brazing is a metal-joining process in which two or more metal items are joined together by melting and flowing a filler metal into the joint, the filler metal having a lower melting point than the adjoining metals. The filler metal flows into the gap between close-fitted metal parts by capillary action.

Steps/ operations involved in soldering

1. Joint fitting:

A clearance of 0.005'' is suitable for most soldering. When soldering pre-coated metals, a clearance of 0.001'' is recommended for maximum mechanical strength.

2. Application of flux:

- Flux removes oxides and stops them from reforming.
- Flux permits displacement by the solder.
- Flux promotes wetting of the surface by the solder.

3. Application of heat:

Heating evenly or uniformly is of utmost importance to ensure a sound joint

Soldering tools /equipment

- a. Soldering iron – Electric
- b. Plumbers torch – propane low heat
- c. Dip soldering – large tank with molten solder to solder multiple joints
- d. Oven heating – only used in production where other heating methods are impracticable.

4. Application of solder :

This takes place in two steps;

- i. Wetting the metal surface
- ii. Filing the gap between the wetted surfaces with solder.

5. Cooling the joint:

As soon as possible, after soldering, the joint may be cooled using water spray or air blast. Slow cooling could cause excessive alloying, resulting to weak or brittle joint.

6. Flux residue treatment:

Non-corrosive fluxes are the ones that are rosin based and do not require removal. Corrosive fluxes are fluxes containing zinc chloride. Its removal is a must to prevent corrosion.

Steps/ operations involved in brazing.

1. Ensure good fit and open clearances.
2. Clean the metals.
3. Flux the parts.
4. Assemble for brazing.
5. Clean the brazed joints.

The gas used for brazing is oxyacetylene; a mixture of oxygen and acetylene.

ASSIGNMENT

1. State any three reasons for applying flux before soldering and brazing respectively.
2. Name the materials (elements, compounds or alloys) used as filler metals for soldering and brazing respectively.