

**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.**