

## Make a Good Soldering

**Soldering** is the method of joining the electronic components with the copper tracks of the PCB. The working performance and the durability of the circuit depend on the soldering. Dirty soldering can make a circuit useless and causes loss of time and money. Soldering requires some skill. Perfection and practicing the good way will make you expert in soldering. The following tips can help you to make a good soldering.



Three essential things necessary for soldering are Soldering Iron, Soldering Lead and Soldering paste or Flux.

### Soldering Iron

It is the electric equipment that provides heat to melt the solder lead. Many types of soldering irons are available. But purchase a good quality 15 to 25 watts iron. If the wattage of the iron is too high, that may destroy the components as well as the copper tracks on the PCB. Choose a soldering Iron with 3 pin cord. Earth connection is necessary to remove the stray current accumulated at the iron tip which can damage static sensitive components like CMOS ICs and MOSFETs.



### Solder

Solder is used to join the solder points on the PCB and the component pins. The quality of the solder lead is important to make a good solder joint. **Rosin core solder** is a good choice. **Acid core solder** is also available which is used for soldering electrical contacts and plumbing metal joints. **Do not use** Acid core solder since its acid content will corrode the copper tracks. A solder with diameter **0.75 to 1 mm** is desirable. A good solder contains **60% Tin and 40% Lead**. Some solder contains flux inside which can also be used.



### Soldering Flux

It is the paste used to make the solder joint clean and firm. Flux will reduce the **melting point** of the solder lead so that the solder will spread uniformly in the solder joint. Fume of Flux is **toxic** so always do electronics works in well ventilated area or use an Exhaust Fan.



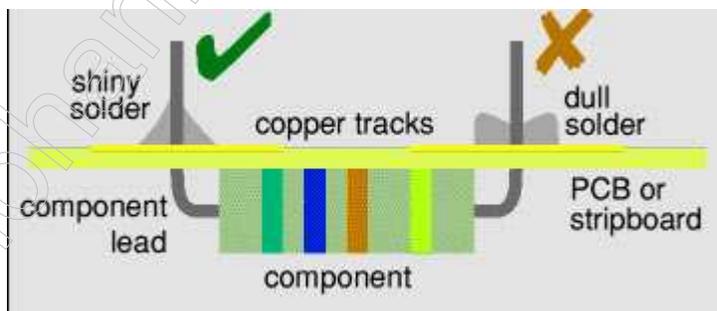
## Maintenance of Iron Tip

Good soldering always requires a clean tip of soldering iron. Before using a new soldering iron **Tin** the tip using a film of solder. This will help to transfer the heat to the solder point easily. After prolonged use, the tip will become dirty due to the accumulation of dirt, flux or rust. Clean the tip with a file and rub with a moist cloth or sponge. Before starting the soldering, always clean the tip with a moist sponge. Over heating of the iron may cause damage to the tip. So always place the soldering tip on a **heat dissipating** material such as **heat sink** or **porcelain block**. An old porcelain fuse carrier is a good choice. If the iron tip is not pointed, file it to make a narrow tip.



## Soldering Tips

1. Clean the soldering points on the PCB with a blade or knife or a sand paper to remove rust, dirt etc. Clean points are necessary to make a firm joint.
2. Clean the leads and pins of components with a small knife to remove rust and make the leads of components shiny.
3. Place the components on the component side of PCB so that their leads will project out through the holes. Resistor should be slightly projected from the surface of PCB to give adequate space to dissipate heat.
4. Apply a thin film of Flux to the solder point and component lead.
5. Keep the iron tip to the solder point for a few seconds to heat up and then apply small quantity of lead to the solder point. Keep the iron tip for few seconds so that the lead will uniformly spread in the joint. Do not keep the iron tip more than 3 seconds when soldering CMOS ICs and MOSFETs.
6. Check whether the solder joint is firm, shiny and pointed.



7. Trim the excess lead just above the solder joint using a Trimmer.
8. As a practice, try to solder Resistors first, then Diodes, Capacitors, ICs etc. Static sensitive ICs and MOSFETS should be soldered last.
9. If static sensitive ICs are used, touch the solder tip to a metal object to remove any static electricity accumulated at the tip.
10. Wires should be soldered carefully. Remove the insulation from the tip of the wire and firmly twist all the strands and trim the tip. Clean the wire tip using a knife to remove the corrosion. The surface of the

wire should be clean. Then apply a thin film of solder at the clean tip of wire. Insert through the hole and solder. Trim the excess part if present.

11. After completing the soldering, check whether there is any cold solder joints or track shorting especially between the IC pins and Transistor pins. If there is any shorting, carefully remove the solder using the iron tip.
12. **Cold solder** is an important problem that causes malfunctioning of the circuit. **Cold solder** means a solder joint without firm connection. The cold solder will appear as a ball over the solder joint. If there is any cold solder, apply some flux and heat the joint to remove the excess solder .



13. If the Solder side of PCB is good, clean it with Spirit or PCB cleaning fluid and dry in air.



14. Carefully check once again before connecting to the power supply.
15. After connecting the power supply, just touch on the components to confirm that they are not heating. If heat develops in the component that may be due to high current, shorting, polarity reversal etc. If so, immediately disconnect the power supply and trouble shoot to remove the problem.
16. If direct AC is used in the PCB, do not touch any points when the circuit is connected to mains.
17. For safety reasons, wear gloves and foot wear during the soldering process. If the melted solder or flux accidentally falls on the skin, wash the skin immediately with cold water.