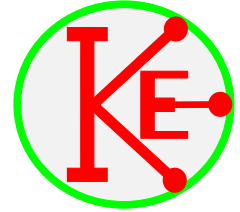


Soldering.



Notes

Solder is an alloy of two or more metals chosen to melt at a lower temperature than any of the individual metals.

Lead solder is made from 60% Lead and 40% Tin and melts at 190°C.

Lead free solder is often made from 95.5% Tin, 3.8% Silver and 0.7% Copper and melts at 217°C.

Solder is used to make a low resistance electrical connection with good mechanical strength.

Solder will only 'flow' onto the metals to be joined if they are both at the same high temperature.

Soldering flux, usually included in the solder, helps to remove dirt and oxides on the metal surfaces.

Soldering flux is essential for the solder to flow freely. If the solder is not flowing freely, fresh solder and flux must be applied.

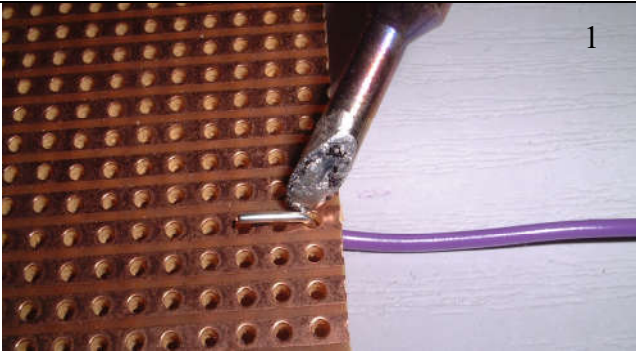
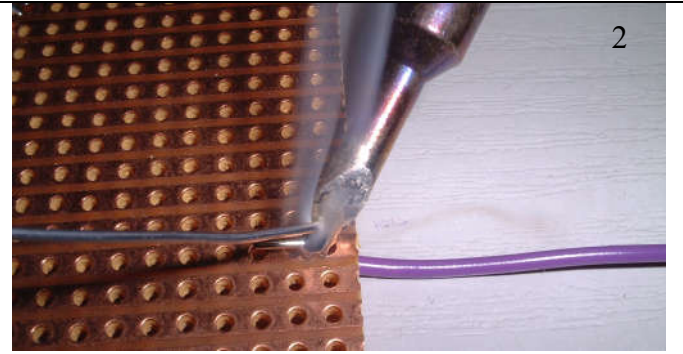
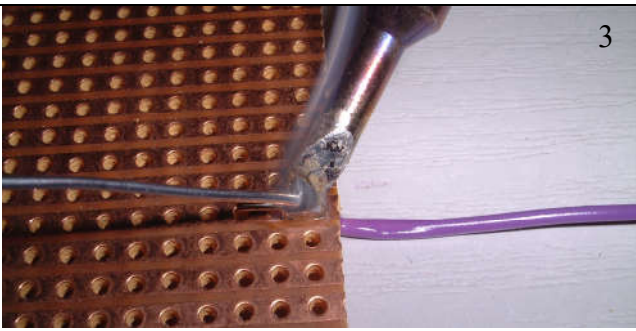
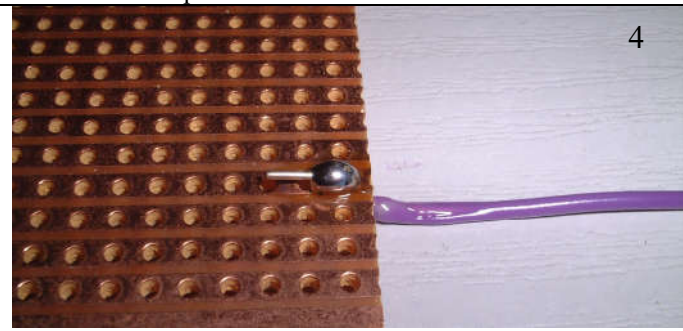
Soldering flux evaporates when heated. Solder should be applied directly to the metals while the soldering iron in place. This ensures a fresh supply of flux to the joint.

If the solder does not flow onto the metals, then they should be cleaned with fine sand paper.

Solder should be used sparingly - just enough to cover the joint of the metals.

Solder joints should be made quickly as some electronic components are easily damaged by heat.

The most common soldering fault is a 'Dry joint'. The joint may look alright, but it has a high electrical resistance. This is caused by a layer of dirt/oxide between the metal and the solder.

	
<p>The soldering iron tip warms both the wire and copper track.</p>	<p>When the wire and track are hot solder is applied to the tip of the soldering iron. Note the flux vapour from the solder</p>
	
<p>As the solder flows onto the wire and copper track, sufficient solder is applied to make a strong joint.</p>	<p>The completed joint is allowed to cool.</p>

Risks and Dangers

- 1). Soldering irons for electronics can reach temperatures as high as 400°C.
- 2). Soldering irons usually operate from a mains electrical supply.
- 3). When heated, the solder becomes a liquid which can drip and splash.
- 4). Solder flux evaporates when heated.
- 5). When something has been soldered, it remains very hot for a while.

Control measures to minimise risks.

- | | | |
|--------|--------------------|---|
| 1, 5). | Burns | Keep body parts away from anything to be soldered or that has been soldered.
Keep the hot soldering iron in a stand when not in use.
Always work over a heat proof mat. |
| 2). | Electric shocks | Inspect a soldering iron, especially the mains cable, for any signs of damage prior to use. If damaged, do not use.
Ensure the 'hot end' of the soldering iron does not touch the mains cable.
Switch off and disconnect any item to be soldered from their power source. |
| 3). | Drips and splashes | Use the minimum amount of solder to make a good connection.
Always work over a heat proof mat.
Ensure that wires to be soldered are secure BEFORE soldering.
Wear goggles to minimise the risk of solder splashing into eyes. |
| 4). | Solder flux | Try to avoid breathing in much of the flux vapours.
Work in a well ventilated room where possible.
If soldering for long periods of time, use an extractor system to remove the flux vapours. |

Treating Burns.

Everyone who solders will, at some time, suffer a burn!
Burns hurt, often disproportionately to the damage caused.

Where appropriate, the burn should be cooled with cold water. This will also offer some relief from the pain.

If the skin is not blistered or broken, some moisturising cream can be applied and paracetamol taken, as required. The burn should be inspected daily to ensure it is healing. If in doubt, seek medical guidance.

If the skin is blistered, but not broken, some moisturising cream can be applied and paracetamol taken, if required. The blister should NOT be burst but covered with a dressing. The burn should be inspected daily to ensure it is healing. If in doubt, seek medical guidance.

If the skin is broken, it should be covered with a dressing and medical guidance obtained.
Paracetamol can be taken, as required.