

Note: The amount of time you need to leave the heat on a component will vary depending on what you are soldering. Small components will only take a second or so to heat up but larger components will need a bit longer. If the solder doesn't melt quickly when applied it's not ready so give it a bit longer. Be careful though, if the soldering iron is left on too long it can start to destroy components through thermal shock and melt the glue on PCB tracks. As a rough guide most common joint will only require a few seconds of soldering time altogether.

Making good joints comes quickly with practice. Experiment with your timings on something that doesn't matter and it will become second nature in no time.

When you're satisfied you have made a good joint trim off the excess component lead with a pair of side cutters.

Desoldering

Unspool some of the desolder braid from the reel and hold the end of the braid over the joint to be desoldered, apply the hot soldering iron tip on top of the braid and the solder will melt and soak into the braid by capillary action. The braid will get hot so don't hold it directly, hold the reel instead. Depending on the amount of solder you need to remove you may need to repeat the process using a fresh section of braid. Snip off used braid and throw it away.

You can also use the solder sucker pump tool. To prime the pump push it down until it locks. Apply the soldering iron to the solder and when it's molten remove the iron and quickly place the solder sucker nozzle directly on the joint and press the button. The pump releases creating a small vacuum which draws up the molten solder into the chamber.

Tip: If you're having trouble removing solder it can help to re-solder the joint first with fresh solder as the additional flux will help everything flow easier.

The desolder pump tool is great for getting rid of large quantities of solder and then use the desolder braid for small areas and to clean up or get rid of tricky spots the pump tool can't reach effectively.

Notes: Take care using the pump tool around small surface mount components or they could be sucked up as well. Let the board cool between repeated attempts of desoldering to prevent damage to it.

When you've completed your work, tin the soldering iron tip and turn off and let everything cool before putting away.

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Beginners Guide to Soldering Electronics



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Safety tips to help make soldering a more enjoyable experience

Soldering irons get very hot, over 250°C, and should never be left switched on unattended.

New soldering irons will smoke for several minutes when first turned on, this is the protective oil used on the heating element during manufacture burning off and nothing to be alarmed about.

When soldering, the solder/flux can spit so where eye protection and don't wear any clothing that you wouldn't want to get the occasional burn hole in.

The soldering stand is designed to hold the iron and protect yourself and worktops from coming into direct contact with the hot metalwork and prevent accidental burning. Note: The metal coil of the soldering iron stand will naturally get pretty warm itself through heat conduction but nowhere near as hot as the soldering iron gets.

Don't solder in confined spaces, ensure adequate ventilation and avoid breathing in the solder fumes.

Using the soldering iron

The iron takes a few minutes to get up to full temperature. To test if it's ready, dab a bit of fresh solder on the tip and if it melts quickly you're good to go. Hold the soldering iron like a pen near the base of the handle.

The soldering tip

The soldering tip is the most important part of the iron, it needs to be kept clean and bright for reliable soldering. If the tip isn't cleaned solder and flux residues burn and oxidise to form a black crust. This oxide crust is an excellent heat insulator and will stop the heat transferring from the tip to melt the solder.

To clean the tip

Run the sponge under the tap and squeeze it out so it is damp. After each solder joint is made wipe the tip on the damp sponge.

Tinning the tip

Before using a new soldering tip, or after cleaning a very dirty one, it needs to be 'tinned'. Simply put, you are coating the tip with a thin layer of solder. This helps keep the tip in optimum condition and promotes good heat transfer so solder flows better making the whole soldering process easier and more reliable.

To tin the tip let the iron get hot and simply melt some fresh solder over the end of the tip, covering the entire tip, then wipe it across the damp sponge to remove excess solder.

Solder

Solder usually contains a flux core. The flux helps clean oxide contamination from the surfaces to be soldered and aids the 'wettability' of the solder so it flows easier. It is mostly the flux burning off that you see as smoke when you solder.

The soldering process

It is important that surfaces to be soldered are clean from grease and dirt. If you suspect they are dirty you can degrease with a solvent such as Isopropyl alcohol, Acetone, Surgical spirit etc. and rub with a fine grade wire wool.

The best and most reliable joints will be made on clean, bright surfaces. If it looks dull, give it a scrub with the wire wool.

If you use solvents be aware some may remove printed ink markings on PCBs so test first and always follow the safety advice on the solvent packaging.

If soldering components to PCBs you will have holes in the board which the component leads go through. Insert the component, paying attention to the correct orientation/polarity of the component and bend the leads over at 45 degrees so they hold the component in place so when you turn the board over to solder they don't fall off.

With the soldering iron in one hand and the solder in the other apply the soldering tip to both the PCB pad and component lead for about a second to get it hot then feed in a small amount of solder to the tip and the solder should quickly melt and flow and form the joint. Once you have enough solder on the joint to cover the PCB pad remove the solder, wait a fraction of a second then remove the iron. Don't move anything for a few seconds while the solder cools enough to set.

Good joints look smooth, shiny and uniform with no gaps or pits in the solder around the PCB pad or the component lead.

If the joint looks pitted then you've had the heat on the solder too long.

If the joint looks wrinkled or has holes around the edges then you may not have had the heat on long enough or the component moved before the solder set.

In some cases it may be enough just to re-heat the area and add more fresh solder to make the joint good. The reason being the flux introduced by the fresh solder re-flows the joint.

If there's too much solder or you have already tried to re-solder and it still looks poor then you're best starting over so remove the solder and redo the joint.