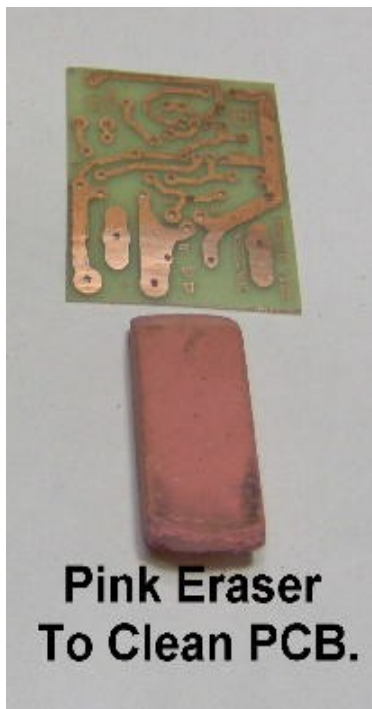


How to solder making good solder joints

1. Prepare the surfaces

Clean , polish the Printed Circuit board



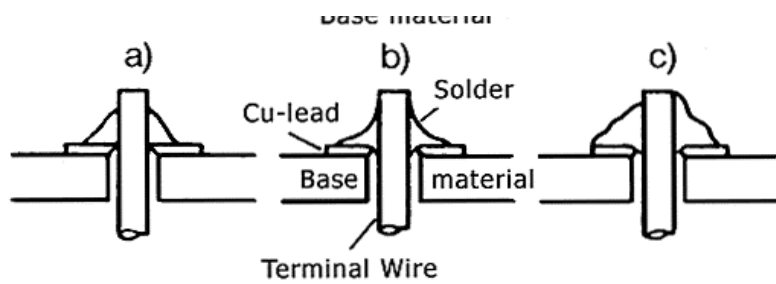
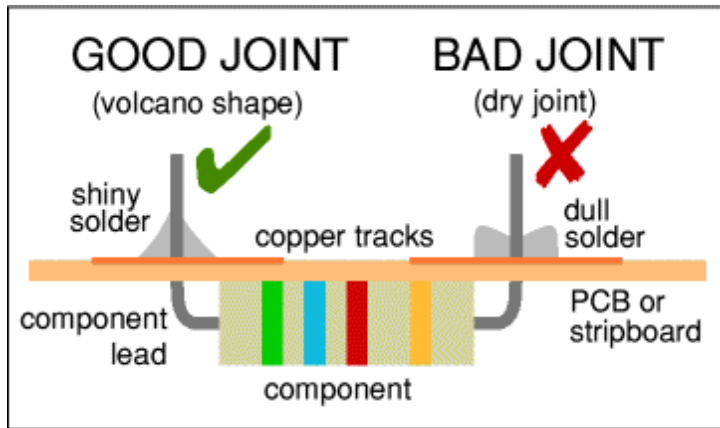
I also use a piece of steel wool

Make sure the component leads are good condition old components may have oxidised leads

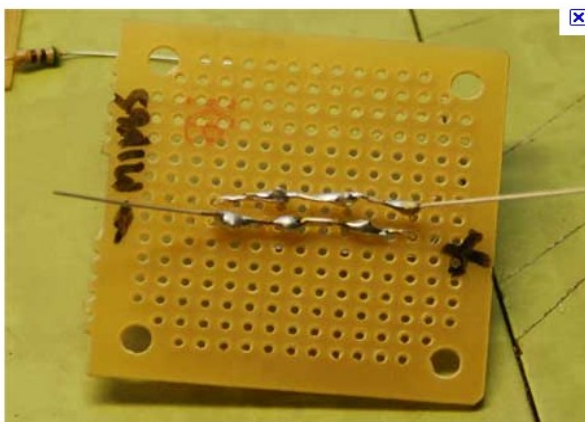
These require cleaning with a piece of steel wool.

You may need to tin the leads with the soldering iron before solder then to the PCB

2. The Good the Bad and the Ugly joint

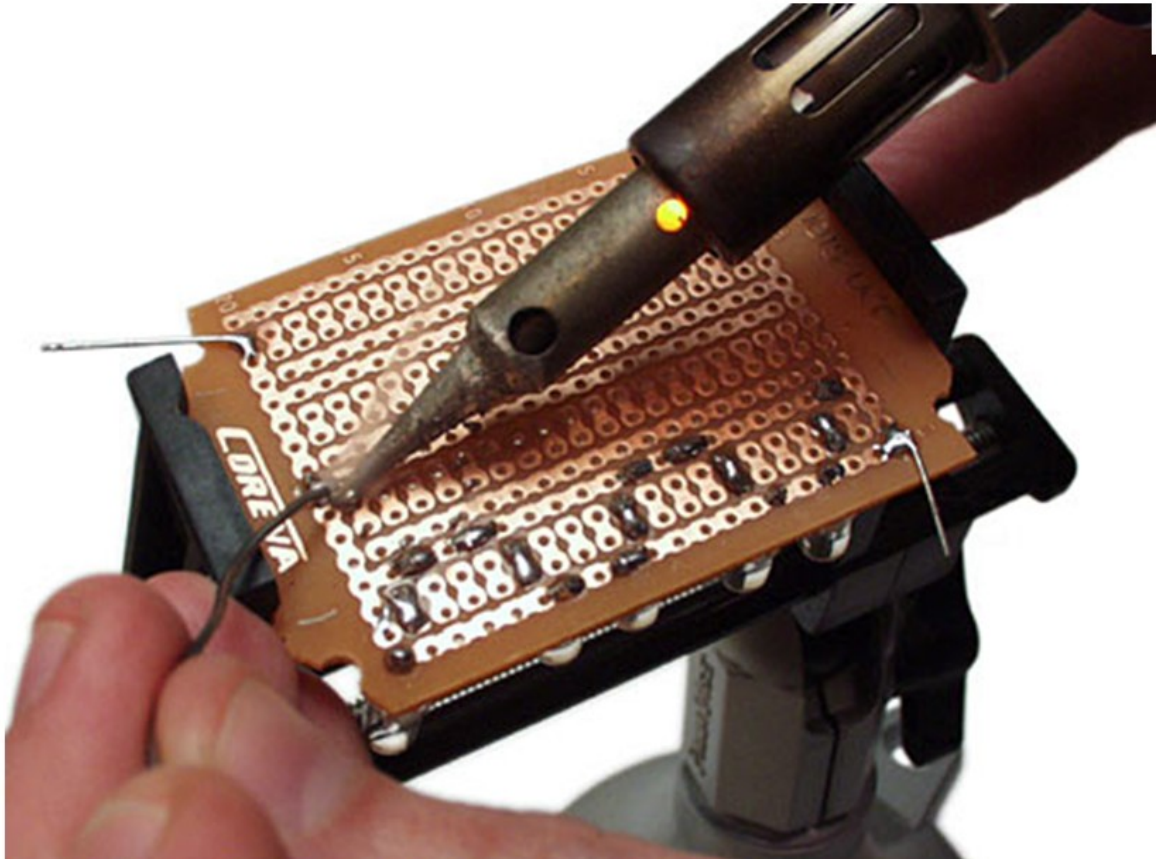


- a) The solder blob (too much solder)
- b) The joint with a good fillet
- c) The dry joint (dull)



A veroboard with blobby solder joints

Making the Solder joint



Heat the component and PCB first before applying the solder for a short time
I will apply the solder 1 second after heating on the opposite side

Apply fresh solder to the joint and heat the other side on the component and PCB
Do not put solder on your iron and transfer it to the joint you will get dry solder joints

3. What Solder to use :



Solder is like deodorant every technician has his own favourite brand

I like Ersin solder

I have learned to use 1mm solder on all my electronics then I don't blob the joints and this flows very nicely and melts at 285deg C

Not all solder is created equally you get

60/40 (tin/lead alloy with flux (Ersin) this melts at a higher temperature
40 percent tin and 60 percent lead this becomes liquid at 188°C

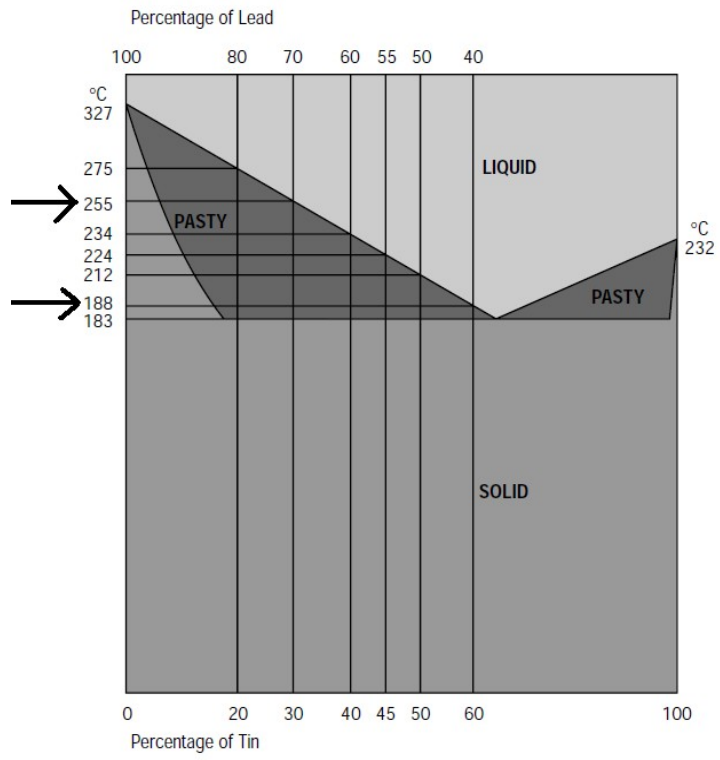
These solders are used in the stained glass industry and also for electronic component such as computers and communications equipment where a minimum of heat can be used to make the connection. For the electronics industry, silver is added to tin/lead solders to reduce the dissolution of silver from silver alloy coatings. Silver may also be added to improve creep resistance.

70/30 (tin/lead alloy) melts at a lower temperature
This alloy is used for coating or pre-tinning before soldering.



Multicore Savbit Solder

is produced especially to overcome the problem of ordinary tin/lead solders dissolving copper.



4. Tips

1. If you can afford it use a temperature controlled soldering iron



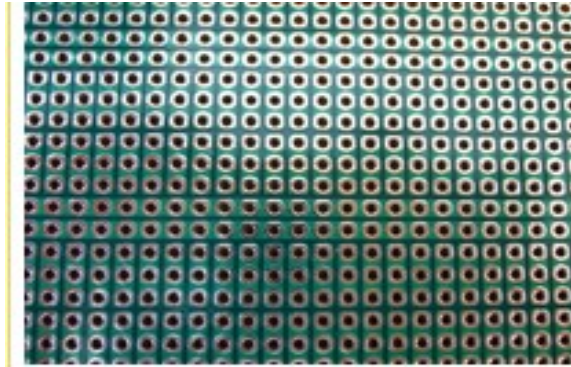
2. Don't use a very hot Soldering Iron you will oxidise the solder and get dry joints , an inexperienced person using a hot iron can damage components and even lift the tracks off the PCB
3. You can tame a hot soldering iron by placing a 1000V PIV 1A diode in series (3A is better) this will reduce the power by 50% a 30 W iron for a beginner is a good option you can put a switch in parallel with the diode to increase the power so it warms up quickly and open the switch to prevent it getting too hot too quickly
4. Always keep your soldering iron tip clean and shiny
5. I find wiping a soldering iron on a wet sponge cools down the iron and then its not ready to solder if you use a temperature controlled soldering iron
If you tamed your iron with a diode then cooling the tip prevents it getting too hot



On the production lines where I once worked the ladies used 100w soldering irons and could make a good solder joint in less than a half a second

6. I use a dry rag or a piece of toilet paper keep the point shiny and hot enough
7. Place Integrated Circuits (ICs) on IC sockets you can damage PC boards replacing them and these components blow so you will need to be able to replace them
8. Use good quality IC sockets with gold contacts if you want to get years of reliable use

9. If you have not mastered or don't have the facilities to design and make PC boards use veroboard and cut the tracks with a 3 mm drill bit



5. Things to avoid

1. Avoid injuries to your eyes from component lead clippings , put a finger on the end of the lead before clipping it
2. Do not chew solder , although I like the taste of solder , its poisonous and the damage is irreversible, however Amadeus Mozart died from lead poisoning
3. Do not remove components without wearing safety glasses
I have solder burns in both my eyes
4. Do not put solder onto the iron and use that to solder your work , its a recipe for dry-joints
5. Do not keep a hot soldering iron too long on a printed circuit PCB the heat will make the tracks lift , this is especially important when desoldering component
6. Don't wipe off the solder with your fingers use a cloth
7. Never use a soldering iron without a stand I have scars from burns
Respect the iron and it wont burn you.
8. Don't use acid flux solder it needs very a high temperature to melt the acid will corrode the components , be fussy when it comes to buying your solder
9. Don't solder old components or dull PCBs first prepare your surfaces with a piece of steel wool
10. Don't use the solder in technician kits buy a decent roll of solder its a worth wile investment
11. Soldering irons must be kept in a stand if you dont have one make one from a piece of wood and coat-hanger wire (blou draat)