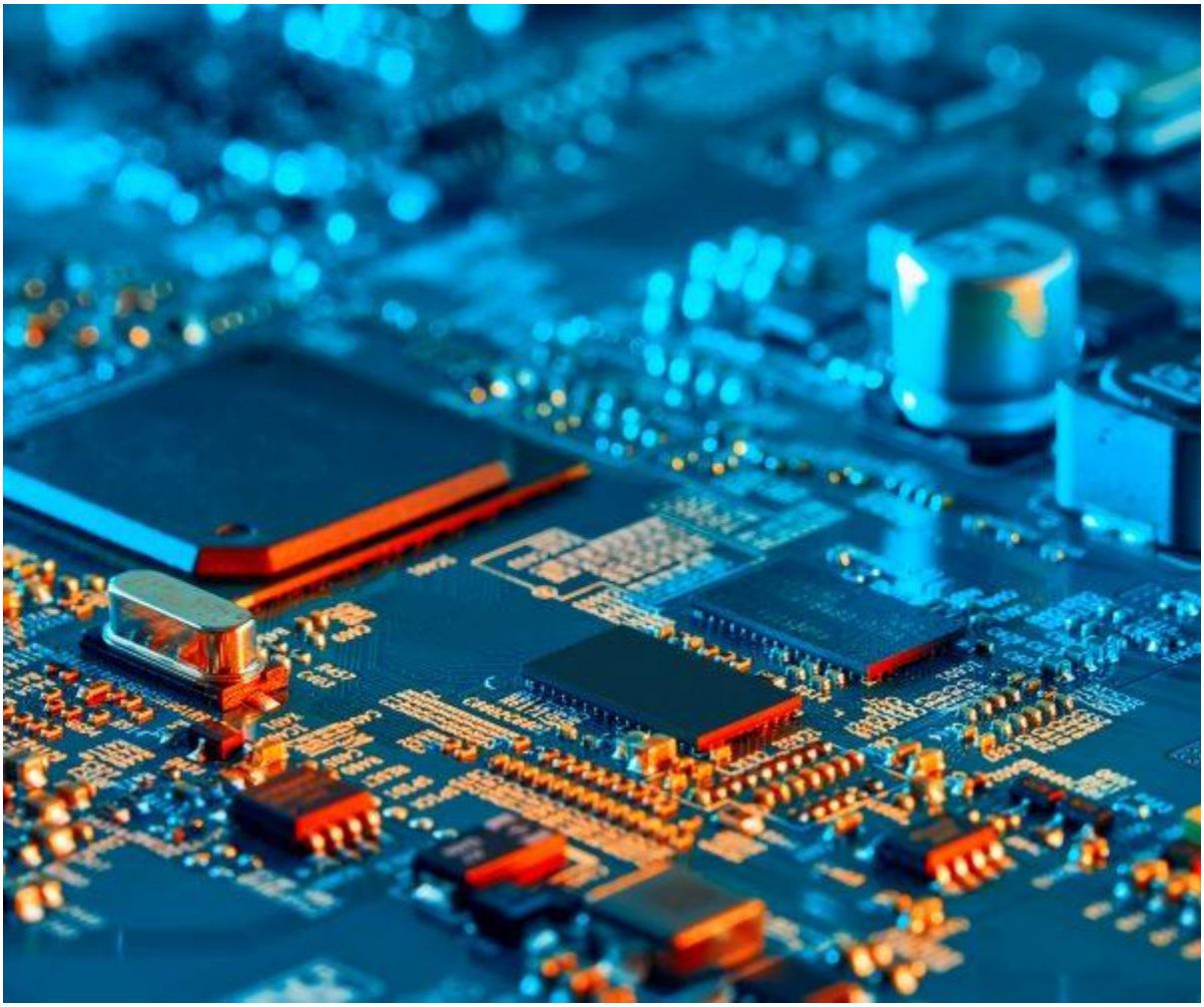
Choosing The Right Finish For Your PCB Design

When it comes to PCB design it's important you chose the right finish to ensure its longevity and durability. Copper can oxidise and to ensure the components weld together correctly you need to choose the right materials.

The quality of soldering is based on the printed circuit board used and the electronic components that are then mounted on its surface; this is what is known as solderability. One of the most common surface finishes used is what is known as hot air solder levelling.

This method consists of using a selected tin-lead deposit, which is immersed in a bath of molten allot and then levelled using hot air. Many people choose to use this method as it is highly robust and is suitable for most applications. However, the more complex circuits are becoming the more people are choosing alternative methods.



Types of PCB Finish

OSP

OSP is also known as Organic Solderability Preservative. This type of technique involves spraying or soaking a water-based organic compound that then selectively bonds with the copper. The method then creates a protective layer of organic metal.

One of the reasons OSP is becoming so popular is that it is much cheaper than alternative methods and uses no toxic materials. In addition to this, it also uses less energy and produces a flat surface area that can provide much better wettability during any re-melts that might be needed.

Just like everything that has its advantages, OSP also has some disadvantages too. OSP has a much shorter storage lifespan and you might only be able to re-melt it a handful of time. It is also known to have a few issues when it comes to assembly reliability.

Hot Air Levelling

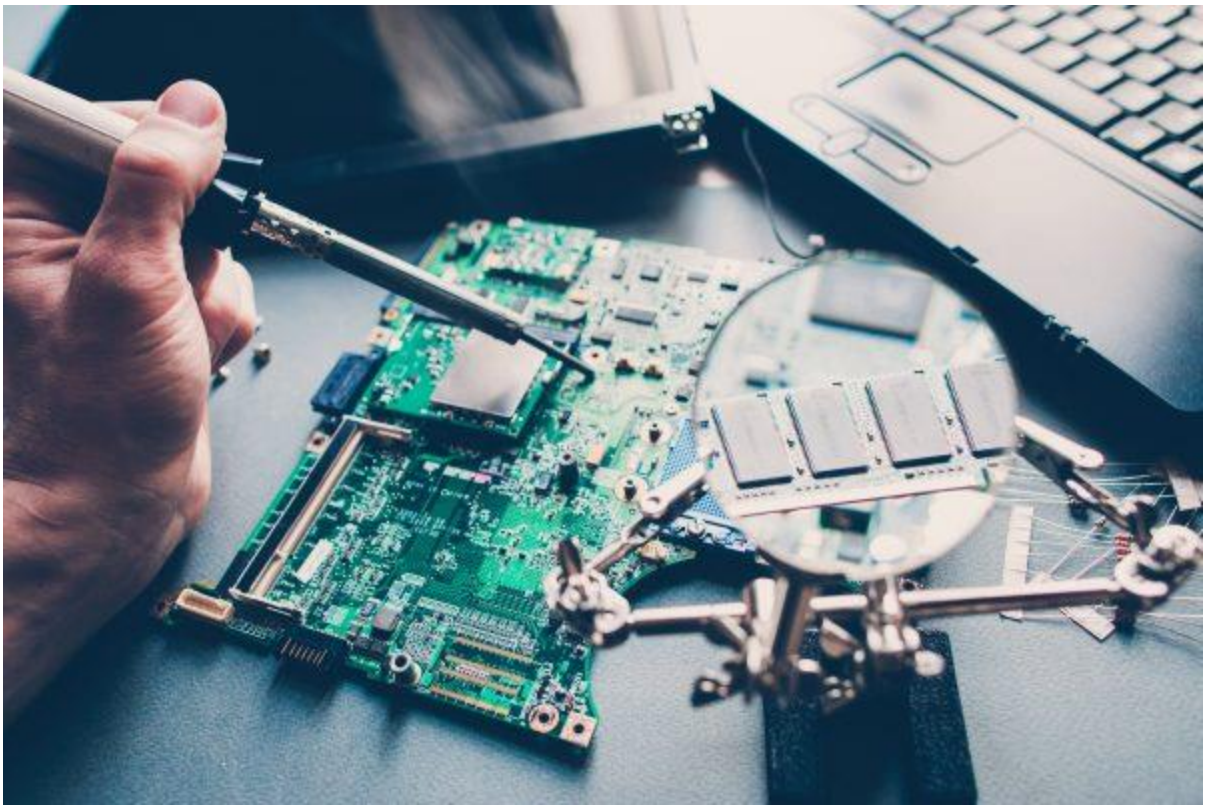
Hot air levelling is a mode of HASL that doesn't require the use of lead. The method involves the printed circuit board being wet using liquid products. Once this part of the process has been completed, it is then dipped in liquid copper and dried using compressed air to remove and residual and excess alloy.

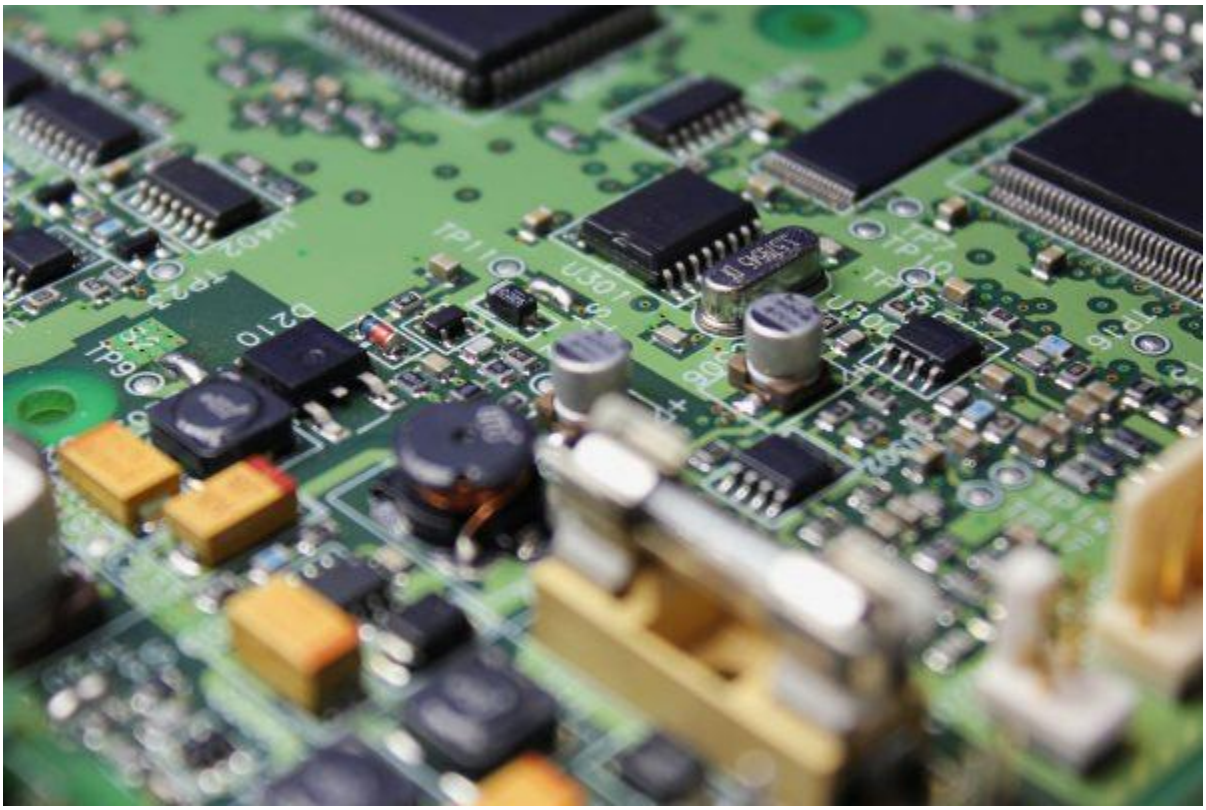
The process of hot air levelling has low production costs and it also offers good solderability and wettability. One of the disadvantages is the flatness, this doesn't allow for assembly with components that are spaced finely apart and the tin can also cause some diffuses in the copper.

Tin Plating

Tin plating is a popular metal finish as it can be deposited using a chemical movement that applies directly to the copper board. As an older technique tin plating has seen its process refined in recent years to ensure a smoother and more flexible process. More and more people are reverting back to tun plating and it is usually the chosen material in SMC and ENIG applications.

Tin offers uniformability and wettability and even multiple re-melts are possible as well. Tin allows for press-fit connection, which makes it perfect for back panel boards. One of the main disadvantages of tin is its thickness. Also as tin oxidises it can also grow whisky parts and fragments can also cause short circuits too.





Silver Plating

When it comes to PCB silver plating is a highly popular option and the process is carried out by dipping the circuit board into an acid solution that uses silver salts. Silver plating is used for a number of projects, especially those the use silver wire bonding.

Many people choose to use silver plating as it provides a uniform deposit and also has great wettability as well. However, silver plating does also have some disadvantages as well, as its storage times are much shorts and it can begin to oxidise when it comes into contact with certain elements.

Hard Electrolytic Gold

Gold remains one of the most used methods of PCB finishing. The process involves placing a layer of gold on top of a layer of nickel. Hard electrolytic gold is regularly used as the layer thickness can be adjusted to suit a specific requirement.

For any type of heavy wearing circuit, gold remains extremely durable and that's one of the reasons it is used in objects such as remotes and keywords. If you're considering using gold, you should consider how much movement and contact is required with the object. One of the main downsides to gold is its cost and it's also less flexible when it comes to soldering as well.

Contact Saturn Solutions Today

If you're considering a project that involves PCB, then be sure to contact Saturn Solutions today. One of our team is always on hand to discuss new projects. We can provide advice and guidance on the best PCB finish to choose; ensuring it's suitable for your project and budget.