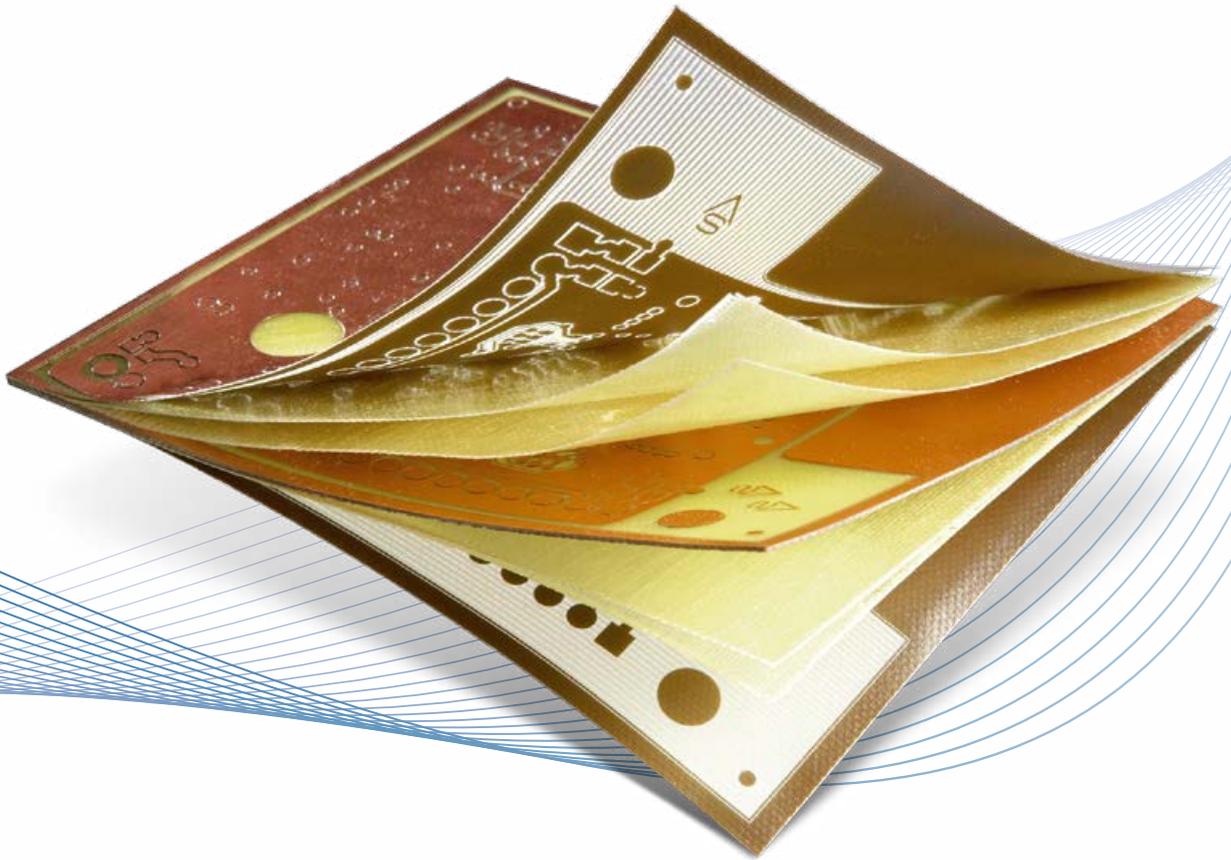
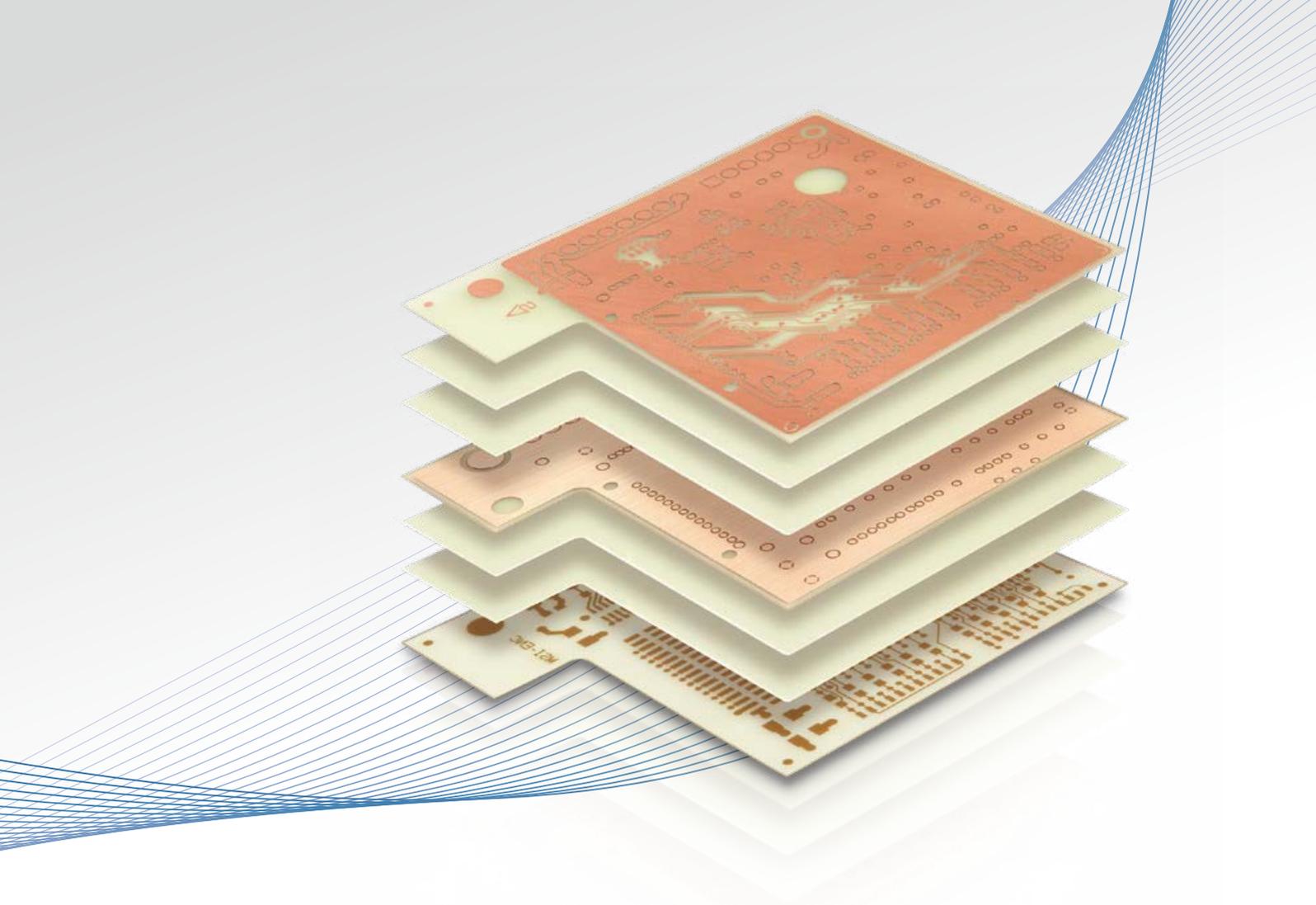


In-House Multilayer Technology  
Industrial Quality Prototypes





# Multilayer Boards from Concept to Reality in Mere Hours

The key to quickly turning circuit layouts into market-ready products is producing prototypes in your own lab. LPKF offers proven solutions for improving time to market; the LPKF prototyping line makes producing small batches or multilayer prototypes easy – even when it comes to RF circuitry and flex-rigid PCBs. Concepts become functional solutions in a matter of hours.

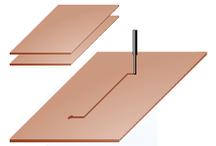
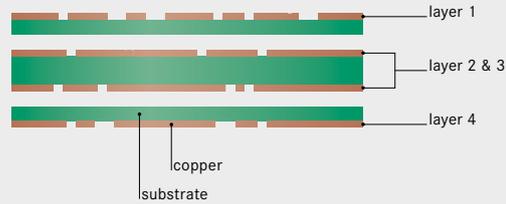
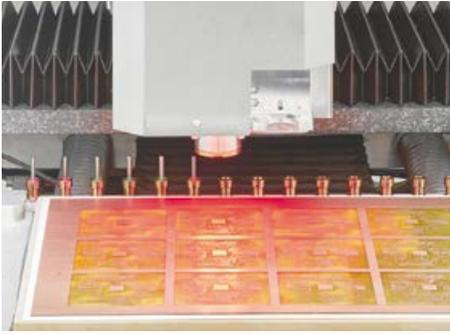
## **Prototyping PCBs with Multiple Layers**

Multilayers feature several layers laminated into a single PCB. The outer layers of a multilayer typically consist of PCBs structured on one side only; the material of the inner layers is coated on both sides. Insulating layers, so-called prepregs, are inserted between the layers. Through-hole connection for up to four layers can be achieved with LPKF ProConduct conductive paste without additional equipment. For multilayers with up to eight layers, galvanic through-hole plating is recommended.

Heat and pressure are used to laminate the outer and inner layers together. Pressure plates and pads ensure the pressure is properly distributed throughout the pressure die. The high temperature melts the prepreg resin when laminating the substrate, providing an ideal connection. To ensure the resin can flow properly, the prepregs are 15 mm shorter than the base material. This circumferential edge must be taken into account when structuring the PCBs.

## Structuring

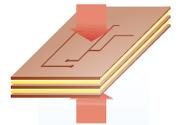
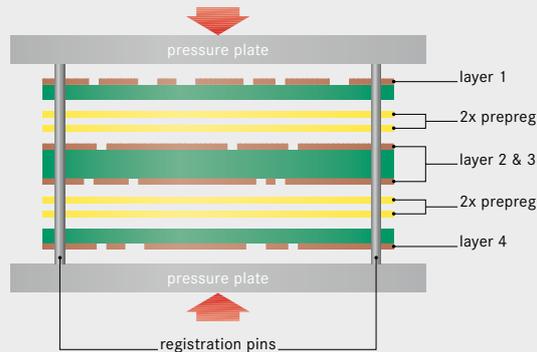
Using the layout data, a LPKF ProtoMat milling plotter structures the PCB tracks onto the substrate's material. Assisted by the automatic tool change and a camera for capturing fiducial marks, it is executed layer by layer ... virtually automatically.



approx. 90 min

## Laminating

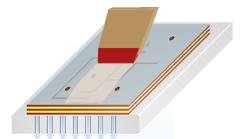
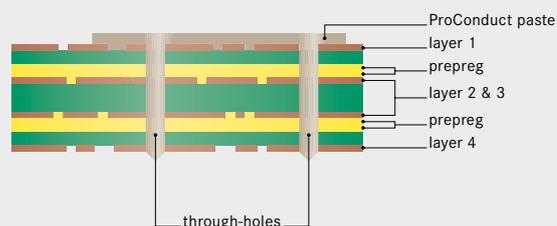
Once the structuring process is complete, the layers are stacked and accurately aligned. "Prepregs" insulate the PCB tracks between layers. During laminating the prepregs bond the layers. The hydraulic press LPKF MultiPress S is used for laminating – its preset processing elements (temperature, pressure, and time) deliver perfect results, even in RF multilayers.



approx. 120 min

## Through-hole Plating

The electrical connections for the individual layers form the final circuit. Through-holes are drilled using the LPKF Proto Mat milling plotter. The LPKF ProConduct is used for the electrical connections – a reliable and particularly conductive paste.



approx. 40 min

Cycle time:  
250 min

# Integrated System, Proven Technology

Multilayers are characterized by a high packing density and a large number of circuits. Virtually all complex PCBs are multilayers. The LPKF product range for Rapid PCB Prototyping offers all the tools required to produce fully functional professional quality multilayer PCB samples up to 229 x 309 mm. LPKF even provides in-house solutions for surface finishing tasks like solder resist, layout print

and SMD assembly. Application engineers and service staff are available to support you with processing issues and help identify the right lab equipment for your business. Experience counts. That's why LPKF has been the market leader for high-quality Rapid PCB Prototyping equipment for years.



## Structuring

The LPKF ProtoMat S104 is the LPKF ProtoMat S series machine with automatic tool change, vacuum table and camera for the optical capture of fiducials. Its automatic milling width adjustment ensures accurate PCB structures with identical milling channels.

## Laminating

The LPKF MultiPress S scores with a brief laminating time of approx. 90 minutes and sophisticated temperature manager. A pressure and temperature profile memory offers the perfect amount of support.

## Through-Hole Plating

The electrical connections between individual layers are made by LPKF ProConduct, a pasty through-hole technology developed specifically for lab use. The kit includes all necessary materials and tools (vacuum table sold separately).

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