

PCB Drying Recommendation

Printed circuit boards consist of materials that absorb moisture; some materials absorb more than other. Due to this moisture absorption the PCB may delaminate during the assembly process. Since the introduction of lead free the entrapment of moisture in PCBs is even more critical due to the higher solder process temperatures.

It's therefore highly recommended to dry PCBs before assembly, especially flex and flex-rigid constructions.

Recommended parameters for drying							
Single-sided and double-sided FR4	Multilayer FR4	Multilayer Hybrid	Flexible up to 2 layers	Flexible from 3 layers	Rigid-flex up to 4 layers	Rigid-flex 5 to 8 layers	Rigid-flex more than 8 layers
120°C	120°C	120°C	120°C	120°C	120°C	120°C	120°C
2 hours	2-4 hours**	2-8 hours*	2 hours	2-4 hours**	2-4 hours**	4-6 hours**	4-8 hours**
Maximum processing times after drying							
Single-sided and double-sided FR4	Multilayer FR4	Multilayer Hybrid	Flexible up to 2 layers	Flexible from 3 layers	Rigid-flex up to 4 layers	Rigid-flex 5 to 8 layers	Rigid-flex more than 8 layers
24 hours	8 hours	8 hours	8 hours	6 hours	6 hours	6 hours	6 hours

*Due to the use of different material, the time required for the drying process can variate as the hygroscopic properties of the materials used in hybrid structures may differ from FR4. This also applies to edge contacts.

** The required time depends on the thickness of the flexible layers, the acrylic adhesive thickness on the cover layer, as well as the lay-out. If large copper areas are present, especially on the outer and inner layers moisture removal is delayed because the copper seals these areas. This is also applies to edge contacts.

For more details regarding surface finish and PCB storage conditions see:

IPC-1602 Standard for printed boards handling and Storage

Table-3-1 Recommendations for printed Board Baking Profiles ¹			
Final Finish	Temp.	Time	Comments
Tin	105 - 125°C	4-6 Hours	Baking may reduce solderability. See 3.4.1.5
Silver	105 - 125°C	4-6 Hours	Silver may tarnish. See 3.4.1.4
Nickel/Gold	105 - 125°C	4-6 Hours	See 3.4.1.2
ENIG/ENEPIG	105 - 125°C	4-6 Hours	See 3.4.1.2
Organic Coating	See 3.4.1.1		
HASL/HAL/Fused Tin-lead	105 - 125°C	4-6 Hours	Final surface thickness below 0,77 µm [30.0 µin] may turn into pure intermetallics and render the printed board unsolderable

Note 1. Baking in vacuum or nitrogen atmosphere does not accelerate removal of moisture, but may help preserve solderability, see 3.4.1.

Helmond, 01-02-2024