

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 after a heat shock. It is therefore highly recommended to dry PCBs before assembly, especially flex and flex-rigid constructions.

Since the introduction of lead free the entrapment of moisture in PCBs is even more critical due to the higher solder process temperatures.

See also IPC-2223B "Sectional design Standard for Flexible Printed Boards" Paragraph 5.3.4 "Bake out shall be standard process..."

Conditioned storage Use for all PCBs always sealed packaging and practice air-conditioned storage at: Temperature 20-24 °C, Relative Humidity of < 30-40%

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 2 h	120°C 2 h - 4 h**	120°C 2 h - 8 h*	120°C 2 h	120°C 2 h - 4 h**	120°C 2 h - 4 h**	120°C 4 h - 6 h**	120°C 4 h - 8 h**

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 h	8 h	8 h	8 h	6 h	6 h	6 h	6 h

* Due to the use of different materials, the time required for the drying process can greatly vary, 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 layout. If large copper areas are present – especially on the outer layers, but also in the middle layers – moisture removal from the printed circuit board is delayed because the copper seals these areas. This also applies to edge contacts.

Helmond, 04-01-2020