

## CuFlon Pure PTFE Substrates Machining Guidelines

### **General Principals for Drilling**

CuFlon is a microwave material consisting of PURE Teflon® resin electroplated with copper using a process developed by Polyflon. Longer tool life can be expected when drilling CuFlon than glass-reinforced laminates. It is suggested that, for consistent results, high-grade carbide tools be used. Although tool wear is minimal when drilling CuFlon, it is suggested that an examination under a microscope for tool edge wear and edge chips be done on new tools and should also be conducted after 500 hits (depending on drill diameter, laminate thickness and stack height). The edges of the tools must be kept sharp. A dull tool can produce a hole whose wall is scored and has been over-heated rendering the plating on the wall unacceptable.

### **Drilling Parameters:**

Smooth, burr-free holes can be drilled in CuFlon by following a few standard precautions.

- Use backup material that has a hard outer layer with a paper or wood resin inner. The backup material should be between .093 and .125 thick. A paper-phenolic material is suggested. The entry material should be between .012 and .025 inch thick phenolic.
- Do NOT use aluminum for entry material.
- Do not drill any deeper than is necessary.
- Several CuFlon laminates may be drilled in a stack if drill size and location tolerance allow, however, it is suggested that a sheet of entry material be placed between the laminates.
- Maintain adequate drill foot pressure on the stack during drilling to minimize burr formation.

### **Routing Parameters:**

CuFlon materials are very easy to cut to final shape by punch and die, steel rule die or routing with a carbide end mill. The tolerances, edge smoothness requirements and panel thickness determine the final fabrication method. It is suggested that CNC routing be used for thickness over .020 and where cutting thru copper is a requirement.

- Router bit selection is important. Carbide single or two fluted up cut end mills should be used.
- Routing should be done utilizing a backup material that has a hard outer layer with a paper or wood resin inner. The backup material should be between .093 and .125 thick. A paper-phenolic material is suggested. The entry material should be between .015 and .025 inch thick phenolic
- Rough-cuts and final cuts along inside edges should be made clockwise, while outside edges should be made counter-clockwise.
- The tool surface speed should be kept to 150 feet/min.
- Do not exceed .025 inch depth into the backup material
- Do NOT use aluminum for entry material.

The information contained in this guide is intended to aid in the processing of CuFlon material. There are no warranties, expressed or implied, including warranty of merchantability for a particular application.

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