

## *Recommendations for the Correct Storage of Printed Circuit Board and Multilayer Boards*

### **A BRIEF DESCRIPTION OF THE PROBLEM:**

PCB`s, especially Multilayer boards are extremely sensitive towards moisture. The microscopic structure of the Multilayer material develops a strong capillary power that soaks up the humidity of the surrounding air. Even under very dry conditions it is a question of time that water accumulates in the stored PCB`s. For example: At storage conditions of 20 C° and 35 % of humidity the weight of the epoxyresin of the Multilayer PCB`s rises 0,12 % due to the accumulation of moisture. If the capillary effect leads to an increase of more than 0,17 % a gas pressure of 8-10 bar can be reached, causing delamination.

Even if delamination tests are made after production, the danger of delamination can rise again due to unsafe transportation and long storage times. Therefore we would like to give you following proposals to avoid the described problems:

### **B STORAGE CONDITIONS**

PCB`s should be stored in heated and dry rooms. Constant low humidity is necessary before the soldering processes start. A rapid fall in temperature of more than 7 degrees causes condensation on the stored PCB`s. Humidity should never exceed 65 %. The package must be kept intact although the polyethylene packages capability of keeping humidity away is not really reliable.

### **C STORAGE TIME**

The storage time of PCB`s should be as short as possible. PCB`s should be taken out due to the „first-in, first out“ rule. The the polyethylene packages should be taken away just before the assembling. Remaining PCB`s should be repacked again. To avoid exposure to draught, the packages should be stored in boxes.

### **D SOLDERING TESTS**

PCB`s stored for over several months and being transported under questionable conditions, should be submitted again to a soldering test, being equivalent to your soldering process.

### **E HEAT CONDITIONING OF THE PCB`S**

In any case we suggest a drying process of the PCB`s in a stove to reduce the moisture in the PCB`s to an acceptable minimum. Following parameters can be recommended:

Drying time:	C°
8 hours	120
10 hours	100
18 hours	80

Lower drying temperatures are also possible but need much more exposure time. We also suggest to put the PCB`s vertically in the stove by using a rack. Good results can be achieved if the assembling process of the PCB`s is started immediately afterwards. The time after drying should not exceed 48 hours not to rise the risk of delamination again.