



# **PROCESSING GUIDELINES**

**Laminate: WLM1**

**Prepreg: WLM1B**

**IC Substrate Used White Material for LED**



This product process guideline uses IPC-4101 Standards as a reference, and Shengyi make some changes according to the product characteristics of the actual situation as to making it more suitable for the Shengyi WLM1/WLM1B product use.

## **1. Storage condition**

### **1.1 Laminate**

#### **1.1.1 Storage condition**

- Pack with original forms on the platform or on the appropriate frame, avoiding stress, prevent sheet deformation caused by inappropriate storage which may impact the subsequent PCB processes.

#### **1.1.2 Storage environment**

- Sheets should be stored in ventilated, dry, at room temperature under environment control, avoiding direct sunlight, rain and avoid erosion of corrosive gas (stored environment directly affect the quality of material).
- For double-sided copper clad laminates (cores), to minimize shifting as to avoid scratching the surface of the product, with a suitable environment and condition for storage, the shelf life can be up to two years.
- For single-sided copper clad laminates, with a suitable environment and condition for storage, the shelf life can be up to one year.

#### **1.1.3 Operation manual**

- Wear clean gloves and carefully operate the cores. Copper foil collisions, sliding will cause damage of the cores. Bare hands action will cause contamination to copper foil surface. These defects are likely to cause adverse effects.

### **1.2 Prepreg**

#### **1.2.1 Storage method**

- Levels stored in original packaging form, avoiding stress, prevent sheet deformation caused by inappropriate storage condition.
- Leftover or cut Prepregs should pack and seal with vacuum foil packaging and put it back in the original packaging tray.

#### **1.2.2 Storage environment**

- Prepreg sealed packaging should be stored in free of UV irradiation environment, specific storage conditions and the storage period as follows:
  - Condition: 3 months when stored at <23°C and <50% RH.
- Note: Relative humidity affect prepreg quality the most, pay special attention on weather (conduct dehumidification process is necessary for wet weather).

#### **1.2.3 Cutting guideline**

- Cutting the best way is left to professional staff wear clean gloves during operation, prevent the pollution



of prepreg surface; operation must be careful to prevent prepreg wrinkle or crack, to avoid affect prepregs.

#### **1.2.4 Prepregs Use Recommendations**

- If moving from a low temperature storage space to a higher temperature or ambient temperature storage space, it must go through the temperature settle process, (8 - 24 hours, settle time is varies depending on temperature variation in between two storage conditions). Open package after temperature settle process is completed as to avoid affecting the quality and adhesion of prepregs.
- For PP package stored in above conditions, after open is required to complete the use as soon as possible, for packages opened more than 3 day, it must re-inspect and insure quality before use.
- Leftover or cut prepregs should pack and seal with vacuum foil packaging and put it back in the above stated storage condition.
- For IQC inspection, PP test should be finished within 5 days from the date of acceptance according to IPC-4101 specification.

## **2. PWB Processing**

### **2.1 Panel cutting**

- Sawing (preferred) and shearing method is recommended. Be careful of potential edge cracks when using roller cutter or caused by improper gap or cutter blade abrasion.

### **2.2 Thin core baking**

- Thin core baking depends on actual need. If bake after cutting, it's recommended to rinse cutting panels first, which is able to remove resin powder brought by cutting and avoid etching problem.
- Baking condition: 175°C/2~4h, be sure to avoid contact directly with heater.

### **2.3 Brown oxide**

- Brown oxide is recommended.
- In order to avoid excessive moisture absorption, baking after brown oxide is recommended

### **2.4 Lay-up**

- Ensure prepreg direction of warp and fill at lay-up process. Avoid prepreg reversal or overturn in case of multilayer board distortion after press.

### **2.5 Press process**

- For multilayer pressing, it's recommended to keep heat-up rate at 2~3°C/min when material temperature is from 80°C to 140°C.
- Full pressure setting is recommended at the range of 350 – 420 PSI (about 25-30kgf/cm<sup>2</sup>) (oil heated), specified value should be determined by multilayer feature (lay-up construction and resin filled area).
- Apply full pressure when the temperature of top layer ranges 80-100 °C.
- Curing condition: 190~200°C, 90~120min.



- Maximum 8-10 layers of every open is recommended.
- 14-16 plies of kraft papers (unit weigh is 161g/m<sup>2</sup>) are suggested using at the upper and bottom for every open.
- If pressed by Adara machine, please inform us for more information.
- When adopted single sided or dummy panel for multilayer, be sure to roughen the unclad surface before use, otherwise poor bonding might happen due to smooth surface. Etching double sided board for that purpose is one of optional measures.

## 2.6 Drilling

- Mechanical drilling: New drilling bit is recommended when drilling, 1 panel/stack is recommended. To ensure a good quality of hole wall, the life of new drills and drilling head should be limited to reduced life of 300~1000 hits. On the basis of traditional FR-4 drilling parameters, decrease feed speed 10-20% is advised, please take a trial test to work out the suitable drilling parameter well. Below drilling parameters is for reference.

刀径 mm	孔限 hits	转速 S krpm	进刀 F inch/min	Chipload mil/rev	退刀 U inch/min
0.25	1200	160	68	0.43	500
0.30	1200	155	90	0.58	500
0.40	1400	145	105	0.72	600
0.50	1200	95	72	0.76	800
0.60	1200	90	78	0.87	800
0.70	1500	80	80	1.00	800
0.80	1500	68	82	1.21	800
0.90	1500	62	85	1.37	800
1.00	1500	60	85	1.42	800

- For dense holes area or hole size <0.6mm, LE aluminum cover layer is recommended.
- For boards with dense or heat sink holes, suggest baking after drilling by condition 190°C/3h.

## 2.7 Desmear

- Due to material composition and structure, its chemical resistance is good. Only taking chemical desmear is difficult to remove smear effectively, so both plasma and chemical desmear are advised. Detailed parameters follows the actual PCB structure (overall thickness, hole diameter) for setting.

## 2.8 HAL

- Suitable for lead free HAL process.

## 2.9 Punching/Routing

- Punching is not suitable for PCB profiling process, routing is recommended with reduced routing speed. Try to avoid sudden vibration during routing process which may cause board edge detonation problem.

## 2.10 Packaging

- To prevent moisture effect on the heat resistance of base material, suggest baking finished boards at 125-



135°C/3~5h before packaging. For a long time storage, it's advised to wrap by aluminum pack.

### **3. PWB Soldering**

#### **3.1 Shelf life of PWB**

- 3 months with aluminum vacuum packaging protection.
- Bake at 125°C/3~5h before assembly is recommended.

#### **3.2 Reflow**

- Suitable for lead free reflow process

#### **3.3 Manual soldering**

- For separated or connected pad, manual soldering temperature should range 350-380°C and hold less than 3s for single point.

This process guide is for reference only! Should you have any questions, please feel free to contact us.

ShengYi will support you with prompt and effective service.