



# **PROCESSING GUIDELINES**

**Laminate: S1190**

**Prepreg: S1190B**

**High Performance, High Reliability, Multilayer PCB Used Material**



This product process guideline uses IPC-4101 Standard 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 S1190/S1190B 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 1: 3 months when stored at <23°C and <50% RH.
  - Condition 2: 6 months when stored at <5°C.
- 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 1 or 2, 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 1 or 2.
- 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: 150°C/4-8h, be sure to avoid contact directly with heat supply.

### **2.3 Brown oxide**

- Brown oxide is recommended.
- In order to avoid excessive moisture absorption, baking after brown oxide is recommended at the condition of 120°C/1h and press within 4 hours.

### **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 1.0-2.5 °C/min when material temperature is from 80°C to 140°C.
- Full pressure setting is recommended at the range of 300 – 420 PSI (21-30kgf/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, >60min.
- 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

- New drill bit is recommended.
- Stack count should not be more than 3 panel/stack (calculated by 1.6mm thickness)
- Maximum hit count should range 1000-1500 hits. (1.0 mm hole size)
- Chip load is decreased 10-30% while compared to that of normal material.
- Below parameters are for your reference.

mm	kr/min	IPM	mil/rev	IPM	hits
0.25	160	68	0.43	600	1200
0.30	155	88	0.57	600	1200
0.40	145	105	0.72	600	1400
0.50	95	70	0.74	800	1200
0.60	90	78	0.87	800	1200
0.70	80	80	1.00	800	1500
0.80	68	80	1.18	800	1500
0.90	60	84	1.40	800	1500
1.00	60	85	1.42	800	1500
1.10	60	90	1.50	800	1500
1.20	55	90	1.64	800	1500
1.30	50	95	1.90	800	1500
1.40	50	100	2.00	800	1500
1.50	45	90	2.00	800	1500
1.60	45	90	2.00	800	1500
1.70	40	90	2.25	800	1200
1.80	40	90	2.25	800	1200
1.90	38	90	2.37	800	1200
2.00	38	85	2.24	800	1200
2.10	36	80	2.22	800	1000
2.20	34	80	2.35	800	1000
2.50	30	70	2.33	800	800



3.00	28	70	2.50	800	650
3.30	28	50	1.79	800	480
3.50	25	45	1.80	800	300
4.00	25	35	1.40	800	300
4.50	25	35	1.40	800	300
5.00	22	25	1.14	800	300
5.50	20	25	1.25	800	300
6.00	20	25	1.25	800	200
6.50	20	20	1.00	800	200

- 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

- Recommend to lengthen the working time or increase operation temperature while comparing to normal FR-4 material. Recommend to fix proper swelling and Desmear parameters. Below parameters are for reference only.

Process	Temperature	Time
SWELL	80°C	8~15min
DESMEAR	77°C	10~20min
NEUTRALIZE	40°C	8~15min

### 2.8 Solder mask

- Be careful of panel distortion or warpage due to improper stack-up at pose baking process.
- Base material color will turn to dark at solder mask curing process by UV light. If the darken color is not acceptable, please avoid UV light method for solder mask curing.

### 2.9 HAL

- Suitable for lead free HAL process.

### 2.10 Punching/ Routing

- Not suitable for punching process.
- Routing speed and distance is recommended reducing to some extent as fillers will cause abrasion on rout bit.

### 2.10 Packaging

- To prevent moisture effect on the heat resistance of base material, suggest baking finished boards at 150°C /2~4h 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 packaging protection.
- Bake at 125°C/4~8h before assembly is recommended, especially when stored more than 3 months.

### **3.1 Reflow**

- Suitable for lead free reflow process

### **3.2 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.