



PROCESSING GUIDELINES

Laminate: S1170G

Prepreg: S1170GB

High Performance, Low CTE, High Tg Halogen Free 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 S1170G/S1170GB product use

Halogen-free: Cl≤900ppm, Br≤900ppm, Cl + Br ≤1500ppm(0.15%)

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: 175°C/2-4h, be sure to avoid contact directly with heat supply.

2.3 Brown/Black oxide

- Suitable for brown oxide

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 1.5-3.0 °C/min when material temperature is from 80°C to 140°C.
- Full pressure setting is recommended at the range of 300 – 400 PSI (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, 60-90min.
- Maximum 8-10 layers of every open is recommended.
- 14-16 plies of kraft papers (unit weigh is 161g/m²) 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 2 panel/stack (calculated by 1.6mm thickness)
- Maximum hit count should range 1000-2500 hits. (1.0 mm hole size)
- Chip load is decreased 15-20% while compared to that of normal material.

2.7 Desmear

- Fix proper swelling and desmear parameters for processing, for excessive desmear might cause resin recession or rough edges.

2.8 Solder mask

- Be careful of panel distortion or warpage due to improper stack-up at pose baking process.
- Do not recommend going through solder mask rework process in case measling occurs.

2.9 HAL

- Suitable for lead free HAL process.
- For heavy copper with large copper ground construction, measling around copper or pad lift might happen at lead free HAL process due to excessive thermal stress caused by high temperature. Below measures are for reference.
 - Lower HAL temperature by any possibility and shorten holding time to reduce thermal stress.
 - Baking at 150°C/2-4h before HAL and processing as soon as possible, in order to remove moisture and reduce the risk of measling.
 - Avoid large copper ground or increase properly the thickness of solder mask can provide better buffer on thermal stress.
 - Change large copper ground as gridding structure.

2.10 Punching/Routing

- Punching process is not available.
- Excessive routing speed would abrade the rout bit and might cause corner crack, suggest reducing the speed around 20% when compared to standard FR-4.



- Reduce routing length to avoid corner crack due to routing bit abrasion.

2.11 Packaging

- Avoid stay in process for a long time, for chemicals or moisture in process would affect the heat resistance and bonding strength.
- Suggest baking finished boards at 125°C/4-8h before packaging to prevent moisture effect on the heat resistance of base material. Be sure of the stack height for even heating.
- Consider different packaging materials for moisture prevention and long term storage requirement. 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/4~6h 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.