

This processing guide follows the IPC-4101C standard and is to provide necessary guidance for customer reference, based on S1190/S1190B material features.

1. STORAGE CONDITION

1.1 Laminate

1.1.1 Storage method

Keep laminates as received packaging onto a flat floor or a proper pallet. Avoid heavy pressure in case of distortion occurring due to incorrect storage method.

1.1.2 Storage condition

- Keep laminates at ventilated, dry and ambient conditions. Avoid direct exposure to sunlight, rain and chemical gas.
- The shelf life of laminate maintains two years for double sided and one year for single sided at above proper storage conditions. All internal properties within shelf life meet IPC 4101C/99 specification sheet.

1.1.3 Handling

Handle laminates carefully wearing clean gloves. Collision and slippage will damage the cladding copper. Naked hand operation will contaminate the surface of cladding copper. All above defects may bring bad effects at production.

1.2 Prepreg

1.2.1 Storage method

- Keep prepreg horizontally with received package. Avoid heavy pressure in case of distortion occurring due to incorrect storage method.
- Be sure to re-seal any of remained prepreg with plastic film and put it away properly onto a pallet.

1.2.2 Storage condition

All prepreg should be stored at either of below conditions as received packaging without any influence of ultraviolet ray

- Condition 1: 3 months when stored at $<23^{\circ}\text{C}$ and $<50\% \text{RH}$.
- Condition 2: 6 months when stored at $<5^{\circ}\text{C}$.

Be careful of relative humidity due to its bad effect on prepreg properties. When packaging is open, it's recommended using up within 3 days.

1.2.3 Prepreg cutting

Cut prepreg carefully and prevent pollution or crease.

1.2.4 Usage

- When brought out from cooling warehouse, prepreg should be stabilized to ambient temperature before opening package, keep at least 8 hours is recommended, depending on specified store condition.
- For panel form prepreg after cutting, all should be kept under condition 1 or 2 and used up ASAP. When exceeding 3 days, it's recommended retesting before use.

- For roll form prepreg remained, all should be sealed again and kept at condition 1 or 2.
- For IQC inspection, prepreg should be finished all tests within 5 day from the date of acceptance according to IPC-4101C specification.
- For dehumidification of PP sheet before use, recommended temperature setting: <math><20^{\circ}\text{C}</math>, humidity, 40%, fluctuation range should be kept under 50%.

2. PWB PROCESSING

2.1 Panel cutting

Sawing 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: $150^{\circ}\text{C}/4\text{-}8\text{h}$, be sure to avoid contact directly with heater.

2.3 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.

2.4 Press process

- For multilayer pressing, it's recommended to keep heat-up rate at $1.5\text{-}2.5^{\circ}\text{C}/\text{min}$ when material temperature is from 80°C to 140°C .
- Full pressure setting is recommended at the range of 300 - 420 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 $80\text{-}100^{\circ}\text{C}$.
- Curing condition: 190°C , $>60\text{min}$.
- 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.

2.5 Drilling

- Decrease hit count to some extent.
- Reduce chip load 10-30%, compared to that of traditional FR-4.

2.6 Desmear

S1190 belongs to filled resin system and a little bit hard to desmear compared to traditional FR-4.

- Strengthen desmear and use ultrasonic rinse are recommended.
- Bake after drilling would help to improve desmear effect, customer can adopt depends on actual need. Baking condition: $150^{\circ}\text{C}/4\text{H}$.

2.7 Solder mask

Be careful of panel distortion or warpage due to improper stack-up at pose baking process.

2.8 HAL

- Suitable for lead free HAL process.
- If measling detected, recommend baking at 150°C/2-4h before HAL, and processing within 4 hours.

2.9 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 125°C/4~6h before packaging. If stored for a long time, it's advised to warp 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.