# DATA SHEET

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## PSR-2000 LF03HF / CA-25 LF03

(PSR-2000BJ/CA-25BJ)

1. FEATURES :

PSR-2000 LF03HF is liquid photo imageable solder resist ink ( alkaline development type ) used for screen printing. It is excellent for heat and flux resistance process. Halogen-free product.

2. SPECIFICATION :

| | | |
|---|---|---|
| Main agent | PSR-2000 LF03HF | |
| Hardener | CA-25 LF03 | |
| Color* | Green | |
| Mixing ratio | Main agent : 83 / Hardener : 17 | ( By weight ) |
| Viscosity* | 160 ±20 dPa・s | (Cone / Plate Viscometer, $5min^{-1}$ / 25℃) |
| Tack free window* | 75℃ / 60 min | ( Maximum ) |
| Specific gravity* | 1.3 | |
| Exposure energy* | 300 ~ 500 $mJ/cm^2$ | ( on the solder mask ) |
| Pot life* | 24 hours | ( stored in dark place at less than 25℃ ) |
| Shelf life** | 6 months | ( stored in dark place at less than 25℃ ) |

* : After mixing

** : After manufacturing

| DATA SHEET | PSR-2000 LF03HF /CA-25 LF03 |
|---|---|

## 3. PROCESS CONDITION

| PROCESS | | RANGE |
|---|---|---|
| PWB | FR – 4 , 1.6 mm | |
| Pre-treatment | Acid treatment → brushing | |
| Printing | 100 mesh-count | 90 ~ 125 mesh |
| Hold time | 10 min | 10 ~ 20 min |
| Tack free | ➢ One side each exposure<br>1 st printing : 75℃ / 20 min<br>2nd printing : 75℃ / 25 min<br>➢ Both sides simultaneous exposure<br>75℃ / 30 min | <br>75℃ / 20~25 min<br>75℃ / 25~30 min<br><br>75℃ / 25~35 min |
| Exposure | 400 mJ/cm$^2$ ( on the solder mask ) | 300 ~ 500 mJ/cm$^2$ |
| Hold time | 10 min | 10 ~ 20 min |
| Development | Aqueous alkaline solution : 1 wt% $Na_2CO_3$<br>Temperature of developer : 30℃<br>Spray pressure : 0.196 MPa<br>Developing time : 60 sec | <br><br>0.2 ~ 0.25 MPa<br>60 ~ 90 sec |
| Post cure | Non-plugging : 150℃ / 60 min<br>Plugging : 80℃/30min→110℃/30min→150℃/60min | |

## 4. ATTENTION ON EACH PROCESS :

- As to the operation environment. It is desirable to deal with the ink under the yellow lamps in the clean room. Please avoid using it under white fluorescent lamps or sunlight (directly or indirectly).
- The adequate thickness is 18 ~ 25 μm (on the copper after curing).
  Thin coating possibly reduces its solder heat resistance. On the other hand, thick coating possibly causes the under-cut or low tackiness.
- Please set the pre-cure conditions and tack free window after the confirmation test because they are influenced according to the type of the drying machine and the quantity of the board to be dried.
- Please set the exposing energy after the confirmation test of under-cut, surface gloss, back side exposure and so on because it is influenced according to the material of the board, the thickness of ink, etc.

- Regarding the developing process, please control the developer density, the temperature, the spray pressure and the developer time, etc.
  The inadequacy of control causes the degradation of the developability and the increase of under-cut.
- Please set the post cure conditions considering the curing time of the marking ink.
  Insufficient curing or over curing may cause the degradation of properties.

## 5. CHARACTERISTIC

(1) TACK FREE TOLERANCE WINDOW :

| Drying time ( 75℃ / min ) | 50 | 55 | 60 | 65 | 70 |
|---|---|---|---|---|---|
| Developability | ○ | ○ | ○ | △ | NG |

(2) PHOTO SENSITIVITY :

| Item | Thickness | Energy | Developing time | Sensitivity |
|---|---|---|---|---|
| **Sensitivity** Kodak No.2 (Step density tablet) | 22 ±2 μm | 300 mJ/cm$^2$ | 60 sec. | 7 steps |
| | | 400 mJ/cm$^2$ | | 8 steps |
| | | 500 mJ/cm$^2$ | | 9 steps |
| Resolution (Between QFP) | 40 ±2 μm | 300 mJ/cm$^2$ | 60 sec. | 50 μm |
| | | 400 mJ/cm$^2$ | | 50 μm |
| | | 500 mJ/cm$^2$ | | 50 μm |

(3) PROPERTIES :

| Item | Test method | Test result |
|---|---|---|
| Adhesion | GIF-007AA Standard<br>Cross-cut tape stripping test | 100 / 100 |
| Pencil hardness | GIF-009AA Standard<br>On copper foil, no Cu exposure | 5H |
| Solder heat resistance | Solder float test :thickness 25 $\mu$ m over<br>Rosin flux, 288℃ / 30 sec (1time) | Passed |
| | Solder float test thickness 25 $\mu$ m over:<br>Rosin flux, 260℃ / 30sec (1time) | |
| Solvent resistance | PMA-Ac, 20℃ / 30 min.<br>Immersion and tape peeling | Passed |
| Acid resistance | 10 vol % $H_2SO_4$, 20℃ / 30 min.<br>Scotch tape stripping | Passed |
| Alkaline resistance | 10 wt% NaOH, 20℃ / 30 min.<br>Scotch tape stripping | Passed |
| Insulation resistance | IPC comb type B pattern<br>Humidification : 25~65℃ cycle 90% RH<br>DC100V loading for 7 days<br>Measurement :<br>After the above treatment,loading<br>DC500V for 1 minute at room temperature | Initial :<br>$1.0 \times 10^{13}\Omega$<br>After :<br>$5.0 \times 10^{11}\Omega$ |
| Dielectric constant | JIS C6481 1 MHz<br>Humidification :<br>25~65℃ cycle 90% RH for 7 days | Initial : 4.2<br>After : 4.8 |
| Dissipation factor | JIS C6481 1 MHz<br>Humidification :<br>25~65℃ cycle 90% RH for 7 days | Initial : 0.023<br>After : 0.042 |
| Electroless gold plating | Ni 3 $\mu$ m Au 0.03 $\mu$ m | Passed |
| Halogen contents | Calculated by use raw materials<br>(Calculation value) | Cl≦900 ppm<br>Br≦900 ppm<br>Cl+Br≦1,500 ppm |

Note : The above-mentioned test data is just for reference, not to guarantee the result.

## 6. Attention

A. Operate in area supported by local exhaust or general room ventilation to avoid build-up of high concentration of solvent vapors.

B. Use gloves and apron during operation. Wash with soap and water if ink is attached to the skin.

C. Wash hands and face with soap and rinse out with water.