

**TECHNICAL
DATA SHEET**PSR-4000 G24K/CA-40G24
MS-00150101
MS-00140801
Feb.2016

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**PSR-4000 G24K/CA-40 G24**

(UL Suffix: PSR-4000DE / CA-40DE)

1. FEATURES

PSR-4000 G24K/CA-40 G24 is two component liquid photoimageable solder resist (alkaline developable type) with following features:

- a) Excellent electrolytic/electroless Ni/Au resistance
- b) Excellent water-soluble flux resistance
- c) Excellent high photo-sensitivity

2. SPECIFICATION

| | |
|-------------------|--|
| Main agent | PSR-4000 G24K |
| Hardener | CA-40 G24 |
| Color* | Green |
| Mixing ratio | Main agent : 70 / Hardener : 30 (By weight) |
| Viscosity* | 180dPa/s (Cone plate Viscometer, 5min ⁻¹ / 25deg.C) |
| Solid Content* | 78.0wt% |
| Specific gravity* | 1.4 |
| Tack dry window* | 80deg.C / 60min (Maximum) |
| Exposure energy* | 300 - 500mJ/cm ² (Under Mylar film) 210 - 350mJ/cm ² (On solder mask) |
| Pot life* | 24 hours (Stored in dark place, at below 25deg.C) |
| Shelf life | 6 months (Stored in dark place at below 20deg.C) |

*: After mixing

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3. PROCESS CONDITION

| Process | | Range |
|---------------|---|--|
| PWB | FR-4, 1.6mm | |
| Pre-treatment | Acid treatment - Buff scrubbing | |
| Printing | #100-mesh Tetron screen | 100-125mesh |
| Hold time | 10min | 10-20min |
| Tack dry | <ul style="list-style-type: none"> ➤ Both sides simultaneous exposure 1st printing : 80deg.C/15min 2nd printing : 80deg.C/25min (Hot air convection oven) ➤ Single side exposure 80deg.C/ 30min (Hot air convection oven) | 80deg.C/10-20min 80deg.C/20-35min 80deg.C/20-60min |
| Exposure | 400mJ/cm ² (under Mylar film) 280mJ/cm ² (on solder mask) Metal halide lamp 7kw (ORC HMW-680) | 300-500mJ/cm ² 210-350mJ/cm ² |
| Hold time | 10min | 10-20min |
| Development | Aqueous alkaline solution : 1wt% Na ₂ CO ₃ Temperature of developer : 30deg.C Spray pressure : 0.2MPa Developing time : 60sec | 0.15-0.25MPa 60-100sec |
| Water rinse | Temperature of rinsing water : 25deg.C Spray pressure : 0.1MPa Rinsing time : 45sec | Below 30deg.C 0.1-0.15MPa 45-60sec |
| Post cure | 150deg.C / 60min (Hot air convection oven) | 45-90min |

*In case of applying marking ink, solder mask should be cured at 150deg.C for 30 minutes, then marking ink should be cured at 140deg.C for 20 minutes x 2 cycles. In case no marking ink is applied, solder mask should be cured at 150deg.C for 60 minutes.

4. ATTENTION IN 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).
- After confirmation that ink becomes room temp., please start mixing in accordance with required amount of mixing ratio.
- The adequate thickness is 10 - 20 um (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.

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- Please set the pre-cure conditions and tack dry 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.
- In order to ensure ENIG resistance, please set up appropriate post cure conditions with considering final baking of marking ink. ENIG resistance could be deteriorated due to over baking.

5. CHARACTERISTIC

(1) TACK DRY WINDOW

| | | | | | |
|----------------------------------|-------|-------|-------|---------|---------|
| Drying time (80deg.C / min) | 40 | 50 | 60 | 70 | 80 |
| Developability | Clean | Clean | Clean | Residue | Residue |

(2) PHOTSENSITIVITY

| Item | Thickness | Energy | Developing time | Sensitivity |
|--|------------|---|-----------------|-------------|
| Sensitivity Kodak No.2 (Step density tablet) | 22 +/- 2um | 300mJ/cm ² (210mJ/cm ²) | 60 sec. | 6 step |
| | | 400mJ/cm ² (280mJ/cm ²) | | 7 step |
| | | 500mJ/cm ² (350mJ/cm ²) | | 8 step |
| Resolution (Between QFP) | 40 +/- 2um | 300mJ/cm ² (210mJ/cm ²) | 60 sec. | 60um |
| | | 400mJ/cm ² (280mJ/cm ²) | | 50um |
| | | 500mJ/cm ² (350mJ/cm ²) | | 50um |

The exposure energy is measured below Mylar film (on solder mask) by ORC HMW-680, 7Kw, metal halide lamp.

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(3) END PROPERTIES

| Item | Test method | Test result |
|--|---|--|
| Adhesion | TAIYO Internal Test Method Cross-cut tape stripping test | 100 / 100 |
| Pencil hardness | TAIYO Internal Test Method On copper foil, no Cu exposure | 7H |
| Solder heat resistance | Solder float test : Rosin flux, 260deg.C/30sec (1cycle) | Passed |
| | Solder float test : Water soluble flux, 260deg.C/30sec (1cycle) | |
| Solvent resistance | PGM-AC dipping, temp 20deg.C/20min, Scotch tape peeling test | Passed |
| Acid resistance | 10vol % H ₂ SO ₄ , temp 20deg.C/20min, Scotch tape peeling test | Passed |
| Alkaline resistance | 10wt% NaOH, temp 20deg.C/20min, Scotch tape peeling test | Passed |
| Insulation resistance | IPC comb type B pattern Conditioned: DC100V 25-65deg.C(cycle) / 90% RH / 7 days Measurement: Room temp. DC500V 1-minute value | Initial : 2.8 x 10 ¹³ Ohms Conditioned : 3.2 x 10 ¹¹ Ohms |
| Dielectric constant | TAIYO Internal Test Method, value at 1MHz Humidify: 25-65deg.C (cycle), 90% RH, 7days Measured: at room temperature | Initial : 4.1 Conditioned: 4.8 |
| Dissipation factor | TAIYO Internal Test Method, value at 1MHz Humidify: 25-65deg.C (cycle), 90% RH, 7days Measured: at room temperature | Initial : 0.024 Conditioned: 0.041 |
| Electrolytic Ni/Au Plating resistance | TAIYO Internal Test Method Ni: 5um / Au: 1um | Passed |
| Electroless Ni/Au Plating resistance | TAIYO Internal Test Method Ni: 3um / Au: 0.03um | Passed |

6. ATTENTION

*All test data shown above on this technical data sheet are based on our laboratory test result and only for reference, not guarantee the same on your process.

*All chemicals used in this product might have unknown toxicity. Please handle with your most care referring to the MSDS for use.

*No intentional use of RoHS 2.0 subjected 10 substances (Lead, Cadmium, Mercury, Hexavalent-chromium, PBBs, PBDEs, DEHP, DBP, BBP and DIBP) for this product.