TECHNICAL DATA SHEET

PSR-4000 EG23/CA-40 G23K
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PHOTOFINER®

PSR-4000 EG23/CA-40 G23K

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

1. FEATURES

PSR-4000 EG23/CA-40 G23K is two component, black color, liquid photoimageable solder resist (alkaline developable type) with following features:

a) Excellent electrolytic/electroless Ni/Au resistance
b) Excellent water-soluble flux resistance

2. SPECIFICATION

Main agent	PSR-4000 EG23
Hardener	CA-40 G23K
Color*	Black
Mixing ratio	Main agent : 70 / Hardener : 30 (By weight)
Viscosity*	150dPa/s (Cone plate Viscometer, 5min^{-1} / 25deg.C)
Solid Content*	79.0wt%
Specific gravity*	1.4
Tack dry window*	80deg.C / 60min (Maximum)
Exposure energy*	500 - 900mJ/cm^2 (Under Mylar film) 350 - 630mJ/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

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	➢ Both sides simultaneous exposure 1st printing : 80deg.C/15min 2nd printing : 80deg.C/25min (Hot air convention oven) ➢ Single side exposure 80deg.C/ 30min (Hot air convection oven)	80deg.C/10-25min 80deg.C/20-35min 80deg.C/20-60min
Exposure	700mJ/cm^2 (under Mylar film) 490mJ/cm^2 (on solder mask) Metal halide lamp 7kw (ORC HMW-680)	500-900mJ/cm^2 350-630mJ/cm^2
Hold time	10min	10-20min
Development	Aqueous alkaline solution : 1 wt% Na_2CO_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.

- 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	Slight Residue	Residue

(2) PHOTOSENSITIVITY

Item	Thickness	Energy	Developing time	Sensitivity
Sensitivity Kodak No.2 (Step density tablet)	22 +/- 2um	500mJ/cm^2 (350mJ/cm^2)	60 sec.	8 step
		700mJ/cm^2 (490mJ/cm^2)		10 step
		900mJ/cm^2 (630mJ/cm^2)		11 step
Resolution (Between QFP)	40+/- 2um	500mJ/cm^2 (350mJ/cm^2)	60 sec.	110um
		700mJ/cm^2 (490mJ/cm^2)		100um
		900mJ/cm^2 (630mJ/cm^2)		90um

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

(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_2SO_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 : 5.0 x 10^{12} Ohms Conditioned : 1.0 x 10^{12} Ohms
Dielectric constant	TAIYO Internal Test Method, value at 1MHz Humidify: 25-65deg.C (cycle),90% RH,7days Measured: at room temperature	Initial : 4.5 Conditioned: 4.9
Dissipation factor	TAIYO Internal Test Method, value at 1MHz Humidify: 25-65deg.C (cycle),90% RH, 7days Measured: at room temperature	Initial : 0.025 Conditioned: 0.030
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 2.0subjected 10 substances (Lead, Cadmium, Mercury, Hexavalent-chromium, PBBs, PBDEs, DEHP, DBP, BBP and DIBP) for this product.