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Dual-component, alkaline developable

Liquid photo imageable solder mask

**PSR-2000 CE826HF3 / CA-25 CE80**

September. 2009

Data sheet No.:DAS-035050/037024-01

**1. FEATURE:**

PSR-2000 CE826HF3/CA-25 CE80 is a dual-component liquid photo imageable solder mask designed for screen printing with excellent popcorn and thermal resistance.

**2. SPECTIFICATIONS:**

Product name:	Main agent: PSR-2000 CE826HF3
	Hardener: CA-25 CE80
UL name:	Main agent: PSR-2000BD
	Hardener: CA-25BC
Color:	Main agent: Green
	Hardener: Milk white
Mixing ratio:	Main agent: Hardener = 80 : 20 (by wt.)
Viscosity after mixing:	170±15dPa.s (Cone-plate viscometer 5min <sup>-1</sup> /25°C)
Solid content:	80±3wt%(After mixing)
Specific Gravity:	1.4 (After mixing)
Tack dry window:	75°C×60min(Max)
Exposure:	300-500 mJ/cm <sup>2</sup> (Under Mylar film)
	210-350 mJ/cm <sup>2</sup> (On solder mask)
Post cure:	150°C×60min
Pot life:	24 Hrs. (stored at dark & lustration place and closed, 25°C or below)
Shelf life:	180 days after production (stored at dark place, 20°C or below)

**3. PROCESS CONDITIONS:**

Process	Condition	Tolerance window
Test panels:	FR-4 (thickness 1.6mm)	-
Pretreatment:	Acid rinse → Buff scrubbing → Water rinse → Dry	-
Coating:	Wet 100 g/m <sup>2</sup>	[90-125mesh]
Hold time	10 min	[10-20 min]
Pre-cure:	A: double side printing using pin and double side exposure or single side exposure	[75°C 60min] (Max)
	75°C 30-60min (Hot air convection oven)	
	B: two times printing and pre-cure for double side exposure	
	1 <sup>st</sup> : 75°C 15-25 min (Hot air convection oven)	
	2 <sup>nd</sup> : 75°C 20-35 min (Hot air convection oven)	
Exposure:	400 mJ/cm <sup>2</sup> (Under Mylar film)	[300-500 mJ/cm <sup>2</sup> ]
	280 mJ/cm <sup>2</sup> (On solder mask)	[210-350mJ/cm <sup>2</sup> ]
	Halogen lamp 7kW (ORC HMW-680GW)	
Hold time:	10 min	[10-20 min]
Development:	Solution: 1wt% Na <sub>2</sub> CO <sub>3</sub>	
	Temp. 30°C	
	Spray pressure 0.196Mpa	[0.196-0.245Mpa]
	Time: 60s	[60-100s]
Water rinse:	Temp. 25°C	[20-30°C]
	Spray pressure 0.1Mpa	[0.1-0.15Mpa]
	Time: 45s	[45-60s]
Post cure:	150°C 60 min (Hot air convection oven)	[150°C 30-90 min]

Note: In order to avoid popcorn and blister after post-cure and HASL, the following process is recommendable: 80 deg. C × 60min → 150 deg. C × 60min → cooling (for a while) → 150 deg. C × 30min

**4. ATTENTION ON PROCESS:**

- a) As to operation environment, it is necessary to control temperature, humidity and dust. Please use the yellow lamp, or ultraviolet ray filter. Do not use the white lamp or sunlight.
- b) Incompetent mixing will cause quality problem, such as gloss uneven and post cure problem.
- c) The optimum coating thickness is 20 to 30  $\mu\text{m}$  (after curing), Thinner coating tends to lower the thermal and gold plating resistance. Thicker coating tends to longer cure time and impress when exposure.
- d) If the viscosity is too high to print, can use solvent such as Diethylene Glycol Monoethyle Ether Acetate (Carbitol Acetate) or Reducer-J, the quantity of the solvent can not exceed 2%, (one Kg ink can add 20cc solvent at best), otherwise, it may causes lower resistance to thermal and gold plating.
- e) As every plant's drying equipments, process condition and quality target is different, so the temperature and drying time may also have difference. Please do verification test to define the operating conditions.
- f) As every plant's exposure equipments, process condition and quality target is different, so the exposure energy and development time may also have difference. Please do verification test to define the operating conditions.
- g) Please adjust the development solution, temperature, spray pressure and time follow this data to decrease the undercut and get the excellent result.
- h) Insufficient cure of the ink can lower the thermal resistance, and excess cure can lower gold plating resistance. Furthermore, Curing condition of the solder mask ink should be defined together with the curing condition of the marking ink.

CA: Diethylene glycol monomethyl ether acetate (B.P 217 deg. C)

**5. INK PROPERTIES:****5.1 TACK DRY WINDOWS:**

Drying time (80°C)	40min	50min	60min	70min
Developability	OK	OK	OK	NG

**5.2 PHOTO SENSITIVITY:**

Item	Thickness um	Under mylar film mJ/cm <sup>2</sup>	On solder mask mJ/cm <sup>2</sup>	Result
Sensitivity Kodak No.2	22±2	300	210	7step
		400	280	8step
		500	350	8step
Resolution Between QFP pads	40±2	300	210	60 um
		400	280	60 um
		500	350	50 um

(1 min development)

**6. PROPERTIES:**

Item	Teat Method	Result
Adhesion	Taiyo internal method Cross hatch peeling	100 / 100
Pencil hardness	Taiyo internal method No scratch on copper	6 H
Thermal resistance	Rosin flux 260°C/30sec, 1cycles	Passed
Acid resistance	10vol% H <sub>2</sub> SO <sub>4</sub> 20°C/20min. (Dip) Tape peeling test	Passed
Alkaline resistance	10wt% NaOH 20°C/20min. (Dip) Tape peeling test	Passed
Solvent resistance	PGM-Ac 20°C/30min. (Dip) Tape peeling test	Passed
Insulation resistance	IPC comb type (B pattern) Humidification: 25-65°C/90%RH/ DC100V Cycling for 7 days Measurement: DC500V 1min.	Initial 3.6×10 <sup>13</sup> ohm Conditioned 2.9×10 <sup>12</sup> ohm
Dielectric constant	Taiyo internal method Values at 1MHz Humidification: 25-65°C/90%RH/ DC100V	Initial 4.1 Conditioned 4.5
Dissipation factor	Taiyo internal method Values at 1MHz Humidification: 25-65°C/90%RH/ DC100V	Initial 0.025 Conditioned 0.032
Total Halogen amount	Calculation value.Based on the values submitted from the manufacturer of raw materials Cl Br Cl+Br	690ppm 0ppm 690ppm

Note:

- a) The above-mentioned data is based on TAIYO INK (SUZHOU) Company's laboratory test. As every plant's equipments, environment and parameters have difference, the data is only for your reference.
- b) Please work in accordance with MSDS.