Technical Data Sheet	MS-6941900 MS-6941800 01 Sep. 2014

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PSR-4000 LEW7S / CA-40 LEW7S

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

1. FEATURES :

PSR-4000 LEW7S / CA-40 LEW7S is liquid photoimageable solder mask (alkaline development type) for screen printing with following features:

- White color, Halogen free
- Sulfur free
- High resolution
- High Reflectance
- Excellent discoloration resistance against UV rays and heat

2. SPECIFICATION :

Main agent	PSR-4000 LEW7S
Hardener	CA-40 LEW7S
Color*	White
Mixing ratio	Main agent: 85 / Hardener : 15 (By weight)
Viscosity*	160± 15dPas (Cone plate type Viscometer, 5min^{-1} / 25deg.C)
Solid Content*	75±3wt%
Specific gravity*	1.6±0.1
Tack dry window*	80deg.C / 60min (Maximum)
Exposure energy*	500~700mJ/cm^2 (under mylar film) 350~490mJ/cm^2 (on solder mask)
Pot life*	24 hours (stored in dark place at less than 25deg.C)

*After mixing

** After manufacturing

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3. PROCESS CONDITION

PROCESS		RANGE
Substrate	FR-4, 1.6 mm	
Pre-treatment	Acid treatment - Buff scrubbing	
Printing	100 mesh-count, Tetron screen	80~120mesh
Hold time	10 min	10~20 min
Tack free	➢ 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/30~60min.
Exposure	7kw Mwtal Halide Lamp(ORC-680) 600mJ/cm^2 (under art work film) 420mJ/cm^2 (on solder mask)	 500~700mJ/cm^2 350~490mJ/cm^2
Hold time	10min.	10~20min.
Development	Aqueous alkaline solution : 1wt% Na_2CO_3 Temperature of developer : 30deg.C Spray pressure : 0.20Mpa Developing time : 60sec.	 0.15~0.25MPa 45~75sec.
Water rinse	Temperature : 25deg.C Spray pressure : 0.2MPa Rinsing time : 45sec	Below 30deg.C 0.1~0.15MPa 45~60sec.
Post cure	150deg.C / 60min. (Hot air convection oven)	

REMARKS:

For applying legend ink, solder mask should be cured for 30 minutes at 150deg.C, and then legend ink is to be cured at 140deg.C.20 minutes 2 cycles.

In case of not applying legend ink, final bake at 150deg.C for 60 minutes.

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4. ATTENTION ON EACH PROCESS:

Recommendable workshop condition

- Operation under yellow lamps(UV cut) in a clean room with ambient temperature at 20~25deg.C / 50~60%RH.
- Open up the package when it becomes ambient temperature. Stir the hardener well first before mixing with the main agent. Keep stirred well when you put the hardener together with the main agent.
- The adequate thickness after curing is 10 to 20 um .
  Coating thickness less than the said may lower solder heat resistance, chemical resistance and Tin plating resistance.
  Coating thickness more than the said my cause undercut problem and insufficient tackiness.
- As curing conditions and windows are variable depending on the type of the drying oven, the board quantity to input, etc., set it suitable to your process after testing.
- As exposure energy is variable depending on material type of substrates (UV absorbent, imide-type material etc.) and on coating thickness, prior testing on resolution (no undercut), surface gloss level and shoot-through, etc. should be conducted to set to the optimum condition.
- Control well the quality of developing agent in its density, temperature, spray pressure and dwelling time. Insufficient control may cause deterioration in developability or undercut.
- Final baking condition should be set with consideration of curing time of nomenclature ink. Shortage or excess in curing may cause deterioration of end properties.
- In case of Ni/Au plating, curing time of nomenclature ink should be considered for setting final baking condition of solder mask. Overcure causes lower Ni/Au resistance.

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5. CHARACTERISTIC

(1) DEVELOPMENT TOLERANCE WINDOW:

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

(2) PHOTO SENSITIVITY:

Item	Thickness	Energy	Developing time	Result
Sensitivity Kodak No.2 (Step density tablet)	22+/-2um	400mJ/cm^2 (280mJ/cm^2)	60sec.	8 step
		600mJ/cm^2 (420mJ/cm^2)		10 step
		800mJ/cm^2 (560mJ/cm^2)		11 step
Resolution (Between QFP pads)	40+/-2um	400mJ/cm^2 (280mJ/cm^2)	60sec.	80 um
		600mJ/cm^2 (420mJ/cm^2)		70 um
		800mJ/cm^2 (560mJ/cm^2)		60 um

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

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(3) PROPERTIES:

Item	Test method	Test result
Adhesion	TAIYO internal Test Method Cross hatch tape peeling	100 / 100
Pencil hardness	TAIYO internal Test Method No scratch on copper foil surface	6H
Solder heat resistance	Rosin flux, Solder float:260deg.C/ 10sec. (1cycle)	Pass
Solvent resistance	Tape-peel test after immersion in PGM-AC, 20deg.C.,20min.	Pass
Acid resistance	Tape-peel test after immersion in 10 vol % H_2SO_4, 20deg.C.,20min.	Pass
Alkaline resistance	Tape-peel test after immersion in 10 wt% NaOH, , 20deg.C.,20min.	Pass
Electroless gold plate	TAIYO's Internal Test Method Ni 3um Au 0.03um	Pass
Insulation resistance	IPC comb type B pattern Humidify : 25-65deg.C,90% RH, DC100V for 7 days Measurement : DC500V / 1 min value at room temperature	Initial 1.0×10^{13} Ohm Conditioned 1.0×10^{12} Ohm
Reflectance ratio	TAIYO's Internal Test Method KONICA-MINOLTA(CM-2600d) Pretreatment ; Reflow 285deg.C x 3times Solder mask thickness ; 20um(on Cu)	Initial / Pretreatment Y value: 87 / 85 460nm: 88 / 83 520nm: 87 / 85 640nm: 86 / 85
Sulfur content	BS EN14582(2007)/Combustion Method Detection Limit ; 50ppm	N.D. (Not Detected)

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

6. Attention

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

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

C. No intentional use of RoHS subjected 6 substances (Lead, Cadmium, Mercury, Hexavalent chromium, PBBs and PBDEs) for this product