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No.26 Taishan Road,Suzhou  
New District, Suzhou City,  
Jiangsu Province,P.R.China

**TAIYO INK**  
**(SUZHOU) CO.,LTD.**

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Tel: +86-512-6665-5550  
Fax: +86-512-6665-5015

Dual-component, alkaline developable  
Liquid photo imageable solder mask

**PSR-2000 FR603W-1/ CA-25 FR604**

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## 1. FEATURES:

PSR-2000 FR603W-1 / CA-25 FR604 is a liquid photo imageable solder resist ink (alkaline development type) used for screen printing.

- a) White color.
- b) Excellent Discoloration resistance.

## 2. SPECIFICATINS:

Product name	Main agent : PSR-2000 FR603W-1
	Hardener : CA-25 FR604
U L S u f f i x	Main agent : -
	Hardener : -
C o l o r	Main agent : White
	Hardener : Colorless
Mixing ratio	Main agent : Hardener = 85 : 15 (by wt.)
V i s c o s i t y	150±20dPa.s (Cone-plate viscometer 5min <sup>-1</sup> /25°C, After mixing)
Solid content	81±3wt% (After mixing)
Specific gravity	1.5±0.1 (After mixing)
Tack dry window	75°C ×60min(Max)
Exposure energy	600-1000 mJ/cm <sup>2</sup> ( Under Mylar film)
	420-700mJ/cm <sup>2</sup> ( On solder mask)
P o s t c u r e	150°C ×60min
P o t l i f e	24 Hrs. (stored at dark & lustration place, 25°C or below)



**3. PROCESS CONDITIONS:**

Process	Conditions	Tolerance
Test panels:	FR-4 (thickness 1.6mm)	-
Pretreatment:	Acid rinse → Buff scrubbing → Water rinse → Dry	-
Dilution volume:	100mesh	[ 9 0 - 1 2 5 m e s h ]
Hold time:	10 min	[ 1 0 - 2 0 m i n ]
Pre-cure:	Single side Coating 1 <sup>st</sup> :75°C 20-50 min (Hot air convection oven) Double side Coating 1 <sup>st</sup> :75°C 15-25min (Hot air convection oven) 2 <sup>nd</sup> :75°C 20-35 min (Hot air convection oven)	[75°C 60 min] (Max)
Exposure:	800mJ/cm <sup>2</sup> (Under Mylar film ) 560mJ/cm <sup>2</sup> (On solder mask) Halogen lamp 7kW (ORC HMW-680GW)	[600-1000mJ/cm <sup>2</sup> ] [420-700 mJ/cm <sup>2</sup> ]
Hold time:	10 min	[ 1 0 - 2 0 m i n ]
Development:	Solution: 1wt% Na <sub>2</sub> CO <sub>3</sub> Temp.: 30°C Spray pressure: 0.196Mpa Time: 60 sec	- - [0.196-0.245Mpa] [ 6 0 - 9 0 s e c ]
Water rinse:	Temp.: 25°C Spray pressure: 0.1Mpa Time: 45 sec	[ 2 0 - 3 0 ° C ] [ 0 . 1 - 0 . 1 5 M p a ] [ 4 5 - 6 0 s e c ]
Post cure:	150°C 60 min (Hot air convection oven)	[150°C 30-90 min]

\*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/20min for each side of PCB.



#### 4. ATTENTION ON PROCESS:

- a) As to the operation environment, it is desirable to deal with the ink under the yellow lamps in the clean room which the temperature and the relative humidity is controlled at 20-25°C, 50-60% respectively. Please avoid using it under white fluorescent lamps or sunlight (directly or indirectly) because of the photopolymerization of the ink.
- b) Please mix with specified amount of hardener when the ink cools down to the room temperature. If it is found that the separation of the ingredient, please stir up sufficiently.
- c) If the main agent and the hardener could not be mixed sufficiently, will lead to inferior quality such as uneven gloss or poor solidification
- d) The adequate thickness is 10-20  $\mu\text{m}$  (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.
- e) If you feel difficulty in printing due to high viscosity, please use dilution such as Diethylene Glycol Monoethyle Ether Acetate (Carbitol Acetate) and Reducer-J. The maximum of the dilution is controlled to 2wt% (20 cc dilution could be added at most per kilogram), otherwise would lead to the flowing of ink or the poor heat and gold-plated resistance.
- f) Please test the production range according to the drying equipment, temperature and time of curing, production condition, kinds of dilution and requirements for quality.
- g) Please test the production range according to the exposing equipment, exposing energy, development time, production condition and requirements for quality.
- h) Please adjust the density and the temperature of developer, control the spray pressure and development time to avoid degradation of the developability according to the sheet.
- i) Please set the post cure conditions considering the curing time and temperature of the ink. Insufficient curing or over curing may cause the degradation of properties. Besides that it is considered the marking ink curing may have bad influence on the solder resist.
- j) Please confirm curing temperature and time first and then use. Because it may lead to oxidation of cuprum and discolor the ink while curing.
- k) Please keep the essential properties, operational performance well and then use. If samples are altered, you should also pay more attention.



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

Drying time (75°C)	40 min	50 min	60 min	70 min
Developability	OK	OK	OK	NG

**5.2 PHOTO SENSITIVITY**

Item	Thickness	Energy		Result
	um	mJ/cm <sup>2</sup> (under Mylar)	mJ/cm <sup>2</sup> (on S/M)	
		600	420	7
Sensitivity Kodak No.2	22±2	800	560	8
		1000	700	9
(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	6H
Solder heat resistance	Rosin flux 260°C/30sec, 1cycles	Pass
Acid resistance	10vol% H <sub>2</sub> SO <sub>4</sub> 20°C/20min. (Dip) Tape peeling test	Pass
Alkaline resistance	10wt% NaOH 20°C/20min. (Dip) Tape peeling test	Pass
Solvent resistance	PGM-Ac 20°C/30min. (Dip) Tape peeling test	Pass
Insulation resistance	IPC comb type (B pattern) Humidification:25-65°C/90%RH/ DC100V 7Days Measurement:DC500V 1min.	Initial $1.0 \times 10^{13} \Omega$ Conditioned $3.0 \times 10^{12} \Omega$

Note: The above-mentioned data is based on lab test @TAIYO INK (SUZHOU), which is only for your reference, because every facility may provide different result.

**7. Attention:**

- Please operate in accordance with SDS.
- Operate in area supported by local exhaust or general room ventilation to avoid build-up of high concentration of solvent vapors.
- Use gloves and apron during operation. Wash with soap and water if ink is attached to the skin.
- Wash hands and face with soap and water. Rinse out the mouth before eating or smoking.