Technological parameters and precautions for liquid phptosensitive solder resist ink

H-9100 GT1HF

1. FEATURES

H-9100 GT1HF is a type of bi-component dilute aqueous alkali developing liquid phptosensitive solder resist ink. It mainly has the following features:

1）Provided with fairly perfect printing behavior; capable of compactly covering the surface of the printed object;

2）Provided with excellent hardness, wear resistance, compactness cutability, chemical resistance, and heat resistance etc;

3）Provided with low DK/DF;

4）It had passed the SGS test, known as a type of environmental-friendly product。

2. SPECIFICATION

Color*	Green
Mixing ratio	Main agent : Hardener = 900 : 100 (By weight)
Viscosity	160 ±20 dPa·s (VT-04 Mode Viscometer, $5min^{-1}$ / 25℃)
Tack free window*	75±2℃\60 min (Maximum)
Exposure energy*	300 ~ 500 mJ/cm^2 (on the solder mask)
Pot life*	24 hours (stored in dark place at less than 25℃)
Shelf life*	6 months (stored in dark place at than 25℃)

* : After mixing

3. PROCESS CONDITION

PROCESS		RANGE
PWB	FR – 4 , 1.6 mm	—
Pre-treatment	Acid treatment → brushing	—
Printing	43T mesh-count	—
Hold time	10 min	10 ~ 20 min
Tack free	➢ One side each exposure 1 st printing : 75℃ / 20 min 2nd printing : 75℃ / 30 min ➢ Both sides simultaneous exposure 75℃ / 40 min	 75℃ / 15~25 min 75℃ / 25~35 min 75℃ / 35~45 min
Exposure	400 mJ/cm^2 (on the solder mask)	300~500 mJ/cm^2
Hold time	10 min	10~20 min
Development	Aqueous alkaline solution : 1 wt% Na_2CO_3 Temperature of developer : 30℃ Spray pressure : 0.196 MPa Developing time : 60 sec	0.2~0.25 MPa 50~70 sec
Post cure	150℃ / 60 min (Hot air convection oven)	—

4.CHARACTERISTIC

Item	Test method	Test result
Adhesion	IPC-SM-840C 3.5.2.1/IPC-TM-650 2.4.28.1 Cross-cut tape stripping test	100 / 100
Pencil hardness	IPC-SM-840C 3.5.1/ IPC-TM-650 2.4.27.2 On copper foil, no Cu exposure	6H
Solder heat resistance	Solder float test : Rosin flux, 280℃/10 sec×3 cycle	Pass
Solvent resistance	PMA dipping, room temp./ 30 min Scotch tape stripping	Pass
Acid resistance	10 vol % H_2SO_4, room temp./ 30 min Scotch tape stripping	Pass
Alkaline resistance	10 wt% NaOH, room temp./ 30 min Scotch tape stripping	Pass
Insulation resistance	IPC-SM-840D 3.8.2	$\geq 4.5\times10^{12}\Omega$

Dielectric constant	Laboratory internal method：Values at 10GHz	3.2-3.5
Dissipation factor	Laboratory internal method：Values at 10GHz	≦0.015
Resistance to flame	Certified number :UL-E189612	UL94V-0

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

5. PRECAUTIONS

1) Please store and operate this product in a dust-free place with a temperature of 0-25 ℃; in addition, only yellow light is allowed; do not handle the product in White electric light or sunlight (whether directly or indirectly).
2) The product should be applied in its original state; when it is necessary to adjust the viscosity, it is required to adopt diluent, and the proportion be controlled within 1~5%. Please do the experiment of matching first while adopting other diluent.
3) Once the product is mixed, it should be used up within 24 hours. When opening the can, hand mix it for 1-2 min at first before machine stirring.
4) Surface treatment of bared board has a critical impact on full play of solder resist behaviors.

   Before printing operation, in order to ensure that the PCB surfaces are thoroughly cleaned, dried, and the oxide layer is removed, it is advisable to treat the PCB with chemical microetch and mechanical polish-brush separately or simultaneously so as to absolutely remove the oxide, oil, fat or other pollutant on surfaces of bared boards; wash the boards with water and the dry them adequately; avoid finger touch and carry out solder-resist printing operation as soon as possible for fear of poor adhesive power of printing ink, or degradation of solder-resist performance. Pretreatment for golden board may be soft polish-brush (polish-brush #1000 at least), citric-acid immersion or spraying. Pay special attention to the attendance of pretreatment equipment after water washing phase so that the secondary pollution of board surface can be avoided.
5) Exposure energy may vary as per different bared boards and thickness of printing ink. Please carry out test to determine the lateral erosion grade, surface gloss and reverse-side light-sensation grade. Photometer should be set to level 8-13.
6) Adequately manage the developing solution concentration, temperature, nozzle pressure and time etc. Inadequate management may lead to poor developing performance of printing ink, lateral erosion or blister. In addition, Spray nozzle of developing machine should be regularly smoothed so as to ensure proper developing /rinsing effect in operation.
7) Developing should be within 24 hours after coating. If workshop to be warm and humid and relatively heavy, take to finish the operation within 12hours.
8) In case skin or eyes are exposed to the product, it is required to clean with soap and rinse with plenty of fresh water; do not clean with any solvent.
9) It must not be placed or applied in a site with smoke and fire.