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UV Curable Solder Resist

UVR-150G D50

1. FEATURES

UVR-150G D50 is UV curable Solder ink with excellent in sequential printing for general consumer use, since it's excellent printability and flowing. It's got excellent productivity by uniform coating, Especially, short curing time by U.V. radiation is the most suitable for mass production. And solder heat resistance is an excellent product.

1) Specification

Main Agent	UVR-150G D50/UVR-150G
Color	GREEN
Viscosity	120 Ps(Cone-plate type Viscometer , 5rpm, 25℃)
Specific Gravity	1. 51
Cure Condition	800 ~ 1,200mJ/cm ² (On the ink surface)
Shelf- Life	6 month after manufacturing (Stored in cool & dark place at 10~20℃)

* The above-mentioned viscosity can be changed according to using conditions. It is a recommended standard.

2) Lot number Sign

Lot No.	2003	10	15	2	01
Explanation	Year	Month	Day	Divide	Number

2. PROCESS

Properly Control and maintain the recommendation listed in below. When it is not like that, this is responsible for quality and reliability deterioration.

1) Process Flow Chart and Parameter

- (1) Mixing : Use the Turn Table Mixer. 60rpm, 20~30min
- (2) Pre-treatment : Acid Treatment(Sulfuric acid 5 vol%)
Polishing with Brush Roller . (Buff scrubbing; #600 + #1000),
Water spray cleaning,
Drying ; Heat or Hot air blower
- (3) Screen Printing : #250 ~ #305 Mesh-count / inch (Polyester screen)
- (4) Curing : 800 ~1,200mJ/cm²
(High Pressure Mercury Vapor Lamp or Metal Halide Lamp, 3 Lamps)

2) Attention On Process

- (1) Keep the operation room cleaned. The product must be protected for dust.
- (2) The contaminations of board cause the quality and reliability deterioration.
- (3) Operating in the clean room of the ambient temperature at 20~25 °C / 50~ 60%RH.
- (4) Avoid direct exposure to UV and sunlight. Desirable to use ink in yellow lamps.
- (5) Open up the package when it becomes the ambient temperature. Stir well before use.
- (6) Desirable to use ink without dilution. When necessary, Inquire of ours. Because dilution may deteriorate the properties. In this case, solvent must not be applicable.
- (7) Appropriate coating thickness on copper circuit after cure is 10~15 μm. Coating more than the said value may cause lower adhesion, chemical resistance and pencil hardness.
- (8) As curing condition is variable depending on the type of lamps and the intensity of radiation, set it suitable to your process after testing. Curing condition out of the specified tolerance range may deteriorate the properties of resist coating.
- (9) For cleaning screen mesh, ester and/or ether solvent are applicable. And reuse after drying.

3. PROPERTIES

1) Curing condition Test

(1) Curing condition

Conditions / Result	Solder heat resistance		Remark
	High Pressure Mercury Vapor Lamp	Metal Halide Lamp	
800mJ/cm ²	OK	OK	
1200mJ/cm ²	OK	OK	

(2) Type of Lamps

Type of U.V. Rays	Power	Number of lamps	Conveyor Speed
High Pressure Mercury Vapor Lamp	800mJ/cm ²	3 Lamps	4-6 m/min
	1200mJ/cm ²	3 Lamps	3-5 m/min
Metal Halide Lamp	800mJ/cm ²	3 Lamps	5-7 m/min
	1200mJ/cm ²	3 Lamps	4-6 m/min

2) Coating Properties

(1) General Properties

Item	Test method	Test standard	Test Result
Pencil Hardness	above 4H on the copper	The copper must not be seen	Pass (4H)
Solder Heat Resistance	Solder float test ;(Kester-922) 260±5℃ / 10 sec , 3cycle	No ink peeling	Pass
Adhesion	Cross Cut 10×10 Tape Test	Must remain 100/100	Pass
Appearance /color	Visual Inspection	Identical with past Lot.	Pass
Solvent Resistance	PGM- Ac, 20℃ / 30 min Tape Test	No peeling by scrubbing	Pass
Acid & Alkaline Resistance	10 Vol.% H ₂ SO ₄ 20℃ / 30min 10 Wt.% NaOH 20℃ / 30min Tape Test	No ink peeling	Pass

(2) Reliability

Dielectric Strength	- Raise DC 500V/sec	No change of ink in DC 500V	Pass (1.8KV)
Insulation Resistance	- 1min maintenance in DC100V - 1min maintenance in DC100V, after HASL	More than $5 \times 10^8 \Omega$ More than $5 \times 10^8 \Omega$	- Pass ($2 \times 10^{11} \Omega$) - Pass ($2 \times 10^{11} \Omega$)
Moisture and Insulation Resistance	- 1min maintenance in DC100V, after $50^\circ\text{C} \times 24\text{hr}$ - 1min maintenance in DC100V, after $25^\circ\text{C} \sim 65^\circ\text{C} \times 85\%\text{RH} \times \text{D.C50volt} \times 7\text{day}$ (20Cycle)	More than $5 \times 10^8 \Omega$ More than $5 \times 10^8 \Omega$	- Pass ($2 \times 10^{12} \Omega$) - Pass ($2 \times 10^{11} \Omega$)
Electro Migration	- $85^\circ\text{C} \times 90\%\text{RH} \times \text{DC } 10\text{V} \times 168 \text{ hr}$ - Evaluate by decuple magnifying	More than $2 \times 10^6 \Omega$ No change of appearance	Pass
Hydrolytic Stability	- $97 \pm 2^\circ\text{C}$ 90-98%RH 28days - Macrography and Ink surface rub	External appearance, restless, Crack	Pass
Thermal shock	- -65°C 15 min to $+125^\circ\text{C}$ 15 min, Transition should not exceed 2 minutes. 100 cycles	No blistering, crazing, and delamination	Pass

* Note : The above- mentioned test data is based on our process condition, not to guarantee a test result in your process. The test data is also subject to change without notice.

4. TROUBLE SHOOTING

No.	Problems	Action	Note
1	Spreading of the ink	<ul style="list-style-type: none"> - Screen Tension - Squeegee Hardness - Viscosity of ink - Screen's emulsion - Room Temperature 	
2	Poor drawing off	<ul style="list-style-type: none"> - Examination of the printing condition - Viscosity & flowing of ink 	
3	Pin hole and etc.	<ul style="list-style-type: none"> - Coating thickness of ink - Temperature on board - Pretreatment & Rinsing condition 	
4	Poor adhesion	<ul style="list-style-type: none"> - Coating thickness of ink - Pretreatment & Rinsing condition - Short curing 	
5	Poor pencil hardness	<ul style="list-style-type: none"> - Coating thickness of ink - Pretreatment & Rinsing condition - Short curing 	

* Inquire to business department or R&D institute of TAIYO INK MFG. CO., (KOREA) LTD.

5. CAUTION FOR SAFETY

- Before use, read caution for safety and use exactly..
- The Caution for safety is to prevent danger or damage beforehand in using the product.
- Make the workers to know the caution for safety in catalog.



WARNING

- * Use a suitable conveyance tool at transfer of heavy thing. When convey by oneself, take right posture. Excessive force may cause injury and lumbago.
- * When use, put protection mask, goggle and protection gloves etc. Injury can happen by inhalation and contact in a long or short time.
- * Install local exhauster in operation room. While using, the case which long time or excess amount will inhale the fume it is nauseous, vomit, dizzy and the internal organs damage etc. will be able to occur.
- * After using, annul the empty receptacle without another application.
- * Dispose of the waste according to related law. It can cause serious environmental pollution that incinerate or abandon the waste in land and water.

CAUTION AT USE

- * Avoid direct sunlight, heat source and fire.
- * Necessarily, keep the optimum temperature(10 ~ 20°C). Use the inks 1day after leaving alone at recommendation temperature to intercept the inflow of water and make the state stable.
- * Do not use the product when the shelf-life is expired.
- * When the ink is leaved alone long hours, don't use.

Misapplication different from above contents results in quality deterioration

6. REVISION SHEET

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