UV Curable Inkjet Marking Ink

IJR-4000 EM100

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UV Curable Inkjet Marking Ink

IJR-4000 EM100

1. FEATURES

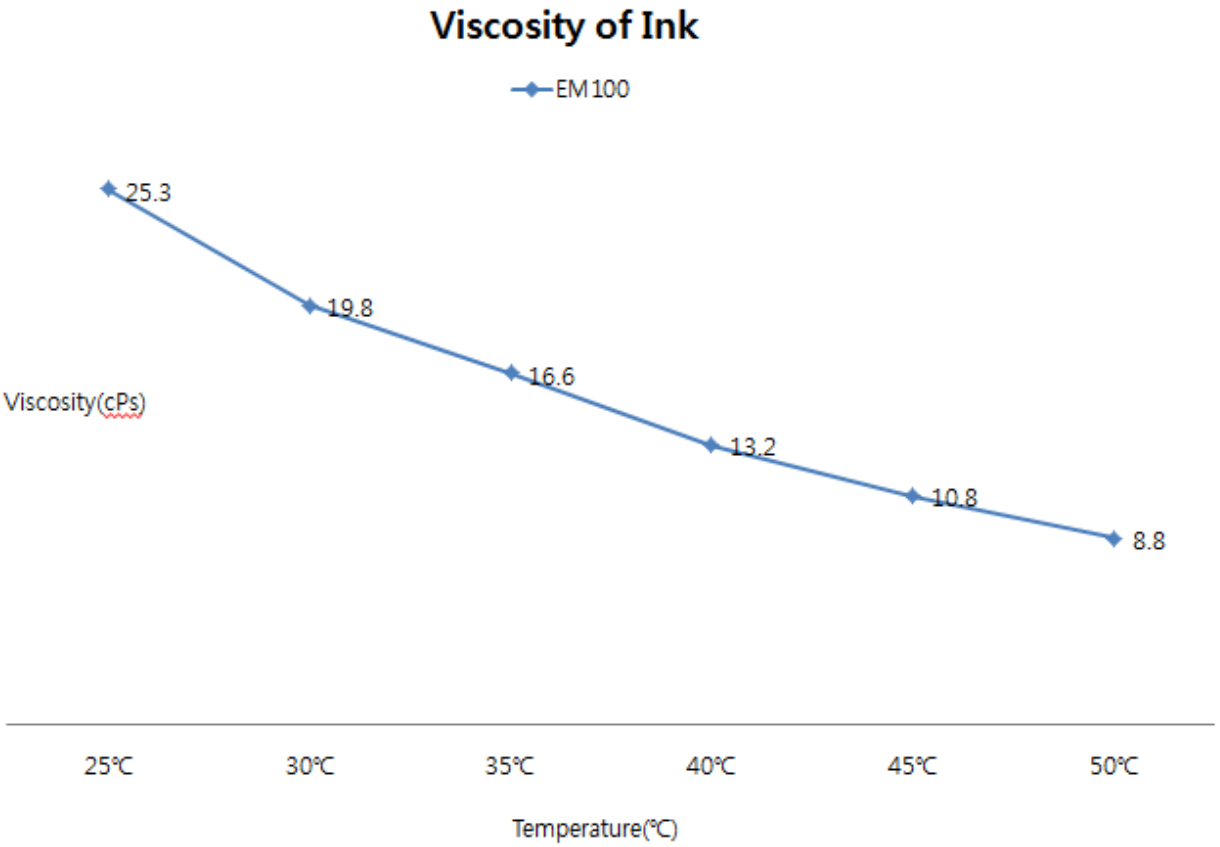
IJR-4000 EM100 is UV curable Inkjet Marking ink for Printed Wiring Board, and applied to Piezo drop-on-demand (DOD) print head

- Fast curing and low energy requirement(usable UV LED system ; 395nm)
- RoHS approved & Low-halogen contents(Halogen-free)
- Good settling stability.
- Excellent adhesion & hardness to semi & Fully cured solder mask.
- Jet stability & low nozzle failure.
- Opacity for the cured film and non- yellowing
- Good chemical and abrasion resistance

1) Specification

Main Agent	IJR-4000 EM100
Color	BLACK
Viscosity	<15cps (Cone-plate type Viscometer , 5rpm, 40℃)
Specific Gravity	1. 08
Surface tension	22~25 mN /m at 20~25℃
Shelf- Life	5 month after manufacturing (Stored in cool & dark place at 10~20℃)

*Use the inks 1day after leaving alone at recommendation temperature to intercept the inflow of water and make the state stable.



2) Lot number Sign

Lot No.	2014	03	11	2	01
Explanation	Year	Month	Day	Divide	Number

2. PROCESS

Exactly Control and maintain to the recommended process as be listed in below. Unless does like that, it could be cause for deterioration of quality and reliability.

1) Process Flow Chart

I. Semi-cured solder mask : Jetting after development of the solder mask → Thermal curing, 150℃ 30~60min.

II. Full-cured solder mask : Jetting after thermal curing of the solder mask → (*UV Bump) → Thermal curing, 150℃ 30~60min. (*UV Bump)

Remark : Physical properties of the inkjet marking ink after curing can be difference according to the process. Especially it can be more difference according to kind of solder mask & it's manufacturer.

*It can be applied UV Bump(1,000mj/cm2) before or after post curing of solder mask as necessary.

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℃ / 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 the solder resist after curing is 10~15 ㎛. 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 ink jet head, esters are applicable..

3. PROPERTIES

(1) General Properties

Item	Test method	Test standard	Test Result
Pencil Hardness	Above 4H on the solder resist (ASTM D-3363)	The copper must not be seen	Pass (above 4H)
Solder Heat Resistance	Solder float test ; Non-cleaning Flux 260±5℃ / 10 sec , 3cycle (J-STD-003)	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 and IPA, 20℃ / 30 min Tape Test	No peeling by scrubbing	Pass
Acid & Alkaline Resistance	10 Vol.% H_2SO_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 (1.5KV)
Insulation Resistance	- 1min maintenance in DC100V - 1min maintenance in DC100V, after HASL	More than $5\times10^8\Omega$ More than $5\times10^8\Omega$	- Pass ($4.3\times10^{11}\Omega$) - Pass ($9.0\times10^{11}\Omega$)
Moisture and Insulation Resistance	- 1min maintenance in DC100V, after 50℃×24hr - 1min maintenance in DC100V, after 25℃~65℃ × 85%RH × D.C50volt × 7day (20Cycle)	More than $5\times10^8\Omega$ More than $5\times10^8\Omega$	- Pass ($1.9\times10^{11}\Omega$) - Pass ($1.4\times10^{11}\Omega$)
Electro Migration	- 85℃×90%RH×DC 10V×168 hr - Evaluate by decuple magnifying	More than $2\times10^6\Omega$ No change of appearance	Pass
Hydrolytic Stability	- 97±2℃ 90-98%RH 28days - Macrography and Ink surface rub	External appearance, restless, Crack	Pass
Thermal shock	-65℃15 min to +125℃15 min, Transition should not exceed 2 minutes. 100 cycles	No blistering, crazing, and delamination	Pass
RoHS approved	2005/618/EC(IEC62321 Edition 1.0:2008)		Pass
Halogen-free approved	JPCA-ES01-2003		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	- Temperature of substrate - Exposure energy - Viscosity of ink - Room Temperature	
2	Poor drawing off	- Examination of the jetting condition - Viscosity & flowing of ink	
3	Pin hole and etc.	- Coating thickness of ink - Temperature on substrate - Development drying and rinsing condition	
4	Poor adhesion	- Coating thickness of ink - Exposure energy - Development drying and rinsing condition	
5	Poor pencil hardness	- Coating thickness of ink - Exposure energy - Development drying and rinsing condition	

* 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

* Do not use the product when it is expired.

Once the expiration date is past, it should be exchanged with a new one; otherwise pigments of this ink settle to the bottom faster and it becomes sticky and hard. The sedimentation and agglomeration can cause major systemic problems.

* Avoid direct sunlight, fire, and any other heat sources.

This product is very sensitive to light.
Even short exposure to light can adversely affect the proper functioning of this ink.
Keep this product in dark and cool temperature.

* Necessarily, keep the optimum temperature(10~20℃). Use the inks 1day after leaving alone at recommendation temperature to intercept the inflow of water and make the state stable.

* Reactive metals which can promote free radical reactions, such as unlined carbon steel, copper alloys, brass and bronze should not be used as materials of construction in direct contact with acrylates.

Misapplication different from above contents results in quality deterioration

6. REVISION SHEET

No.	Date	Reason For Revision	Before Revision	After Revision
0	March 11, 2014	- A new registration	-	-
	-End-			