

Technical Data Sheet

February 14, 2020

TAIYO INK MFG. CO., LTD.

Head office: 900 Hirasawa, Ranzan-machi, Hiki-gun, Saitama, 355-0215 Japan

Marketing Department : TEL: +81-493-61-2832 FAX: +81-493-61-2833

Technical Department : TEL: +81-493-61-2728 FAX: +81-493-61-2729

UV / Thermal curable (One component) solder resist ink

IJSR-4000 JM02E

1. FEATURES

IJSR-4000 JM02E is inkjettable solder resist ink with the following features.

- Excellent adhesion to laminate with dual cure (UV + Thermal) process
- Tack free right after printing due to On-head UV lamp on inkjet head, which provides excellent processability
-

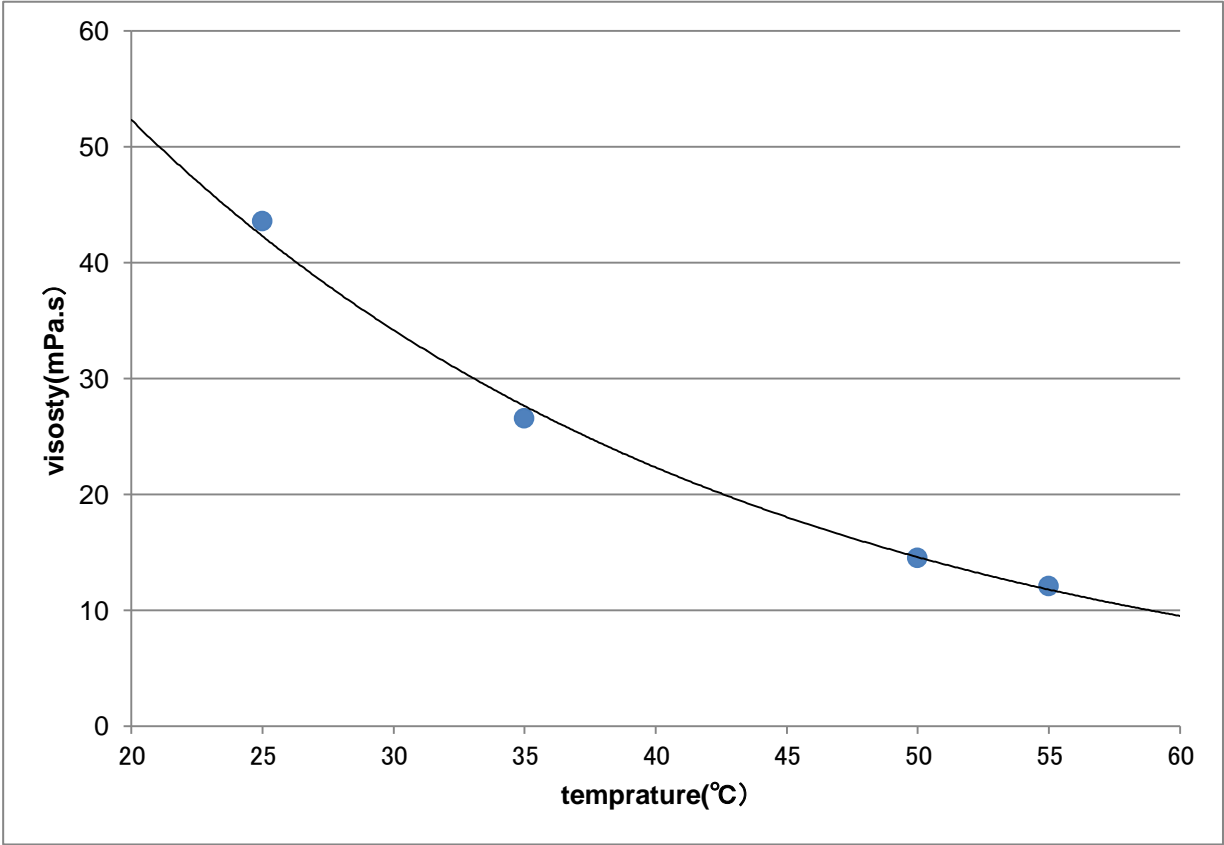
2. SPECIFICATION

Color	Black
Viscosity @25deg.C	14.0±1.5mPa·s (Cone plate type Viscometer, 50deg.C)
Specific gravity	1.1+/-0.1
Surface tension	33.0+/-1.0 mN/m
Standard curing conditions	Preliminary cure: 350~1,000mJ/cm ² @ 365nm LED
	Thermal cure: 150deg.C / 60 min
	UV bump: 1,000~2,000mJ/cm ² @ Mercury lamp
Storage condition	10 – 25 deg.C. Cool place away from direct sunlight.

Technical Data Sheet

IJSR-4000 JM02E

3. VISCOSITY CURVE



Technical Data Sheet

IJSR-4000 JM02E

4. PRINTING PARAMETERS

This parameter is guide for starting printing test. We recommend to evaluate optimal printing parameter for your equipment by use of this guide, because the optimal printing parameter is different for structure of printer, kind of printer head and so on.

Items	Unit	Recommend
Head	-	KM1024i SHE Konica Minolta
Temperature	deg.C	55
Drive Voltage : Vh2 – Vh1	V	10.5 – 5.3
Pulse Width	us	3.9 - 7.8
Meniscus Vacuum	kPa	-0.9
Max Degassing Vacuum	kPa	-66.6
Max frequency	kHz	15
Jetting speed @1kHz	m/s	6.0
Droplet volume @1kHz	ng/drop	7.4

*1 Value of Taiyo's test device

5. STANDARD CURING CONDITION

IJSR-4000 JM02E is cured by below steps.

5-1. UV pre-curing ⇒ 5-2. Thermal curing ⇒ 5-3. UV bump

5-1. UV pre-curing

Light source	Wave length	Total exposure energy (mJ/cm ²)*
365nm LED	UV-A (320-390nm) + UV-A2 (380-410nm)	800-1700

* Measured by UV Power Puck II

5-2. Thermal curing

150deg.C 60min @box oven

5-3. UV bump

Light source	Wave length	Total exposure energy (mJ/cm ²)*
Mercury lamp or Metal halide lamp	UV-A (320-390nm) + UV-A2 (380-410nm)	2000-3000

* Measured by UV Power Puck II

Technical Data Sheet

IJSR-4000 JM02E

6. PROCESS CONDITION

PROCESS	
Laminate	FR-4 or Cu foil
Pretreatment	Acid cleaning - Buff scrubbing
Inkjet printing	Piezo inkjet printer
Coating thickness	35+/-5um
Preliminary cure*	On-head UV lamp (365nm LED): 800mJ/cm ²
Thermal cure	Hot air convection oven: 150deg.C / 60min
UV bump*	UV irradiation device (Mercury lamp): 2,000mJ/cm ²

*Measured by UV Power Puck II

7. ATTENTION ON EACH PROCESS

- For operation environment, desirable to handle the ink under the yellow lamps in the clean room of temp. range 20-25deg.C and 50-60%RH.
- Make ink temperature reach to room temperature, and stir sufficiently before use.
- UV curing conditions depend on the type of UV lamp. Inappropriate UV lamp may cause insufficient curability.

Technical Data Sheet

IJSR-4000 JM02E

8. CHARACTERISTIC (FINAL PROPERTIES)

Item	Test method	Test result
Adhesion	On FR-4, Internal test method Cross hatch tape peeling	100 / 100
	On Cu foil, Internal test method Cross hatch tape peeling	100 / 100
Pencil hardness	TAIYO Internal Test Method On copper foil, no Cu exposure	Above 3H
Solder heat resistance	Solder float test : Rosin flux, 260deg.C / 10sec (3cycles)	Passed
Electroless Ni/Au	Taiyo internal method Ni 3um, Au 0.03um	Passed
Solvent resistance	PGM-AC dipping, 20deg.C/20min, Tape peeling test	Passed
Acid resistance	10vol % H ₂ SO ₄ dipping, 20deg.C/20min, Tape peeling test	Passed
Alkaline resistance	10wt% NaOH dipping, 20deg.C/20min, Tape peeling test	Passed
Insulation resistance	IPC comb type B pattern Conditioned: 25-65degC(cycle), 90% RH,DC100V, 7 days Measurement: Room temp. DC500V 1-minute value	Initial Value: 8.0×10 ¹³ Ω Conditioned: 7.0×10 ¹³ Ω
Dielectric Constant Taiyo	Taiyo internal method, 1MHz Conditioned: 25~65deg.C(Cycle), 90%RH /7days Measurement: at room temperature	Initial: 3.8 Conditioned:4.2
Dissipation Factor	Taiyo internal method, 1MHz Conditioned: 25~65deg.C(Cycle), 90%RH /7days Measurement: at room temperature	Initial:0.029 Conditioned:0.038

Note: The test result is under above-referenced process conditions and test methods.

Moreover, content in this technical data sheet is based on our internal experiment, not to be guaranteed. Therefore, please check the required property in advance of use.

9. ATTENTION

Caution and care is required for handling. For the detail, refer to MSDS.

No intentional usage of restricted substances in EU RoHS to this product and its production process; Namely Cadmium, Lead, Mercury, Hexavalent Chromium, PBB and PBDE.