TAMURA
PRODUCT INFORMATION

FINEDEL DSR-330S50-99MBK

FINEDEL DSR-330S50-99MBK is an alkali developing type, photo-imageable liquid solder resist for simultaneous exposure on both sides of printed wiring board.

- This product is excellent of Ni/Au plating properties.
- This product is halogen free
- Appearance of this product is matt type

1. General specifications for FINEDEL DSR-330S50-99MBK

Table 1 General specifications of DSR-330S50-99MBK

Items	Specification
Color	Black
Viscosity	130±40 dPa･s (Brookfield HBT at 25℃)
Specific gravity	1.4
Non-volatile components	78±3 %
Ignition point (Tag closed type)	76℃
Mixing ratio	Main component : 700 g Hardening agent : 300 g
Pot life (When stored in a dark place at below 20℃)	24 hours after mixing hardening agent
Shelf life (When stored in a dark place at below 20℃)	Main component and hardening agent: 6 months

＊This product is defined as “ halogen free ” according to JPCA-ES-01(below to 900ppm).
Thought this product contains several hundreds ppm of halogen.

2. Example of board processing

Surface treatment of boards	Acid treatment and polishing
↓	
Application to solder side	Screen printing (Screen: T-100B, Emulsion thickness: 12 μm) Wet thickness of coating: 40-45 μm
↓	
Pre-drying	75℃　15 minutes
↓	
Application to component side	Screen printing (Screen: T-100B, Emulsion thickness: 12 μm) Wet thickness of coating: 40-45 μm
↓	
Pre-drying	75℃　20 minutes
↓	
Exposure	500～800 mJ/cm^2 (On the resist surface)
↓	
Developing	1 % sodium carbonate, 29-30℃, 60～90seconds 0.2MPa spray pressure
↓	
Post cure	150℃, 60 minutes
↓	
UV curing*	1000 mJ/cm^2 (80 W/cm, 3 lamps, 5 m/min)

* Perform UV curing process when it is desired to improve the resistance to Au-plating, or when using high activity flux in soldering process of hot air leveler.
In the case of the use of UV symbol marking ink, pre-test for adhesion between UV symbol marking and solder resist should be managed to avoid incompatibility both inks.

3. Direction

As this product is two components type, mix and stir the main component, DSR-330S50-99MBK , and the hardener, CA-330S50-17 , in a mass ratio of 700 g : 300 g before use. And stir for approximately 30 minutes, then use.

Use the ink within 24 hours after the mixing.

4. Precaution for use

a) For cleaning the screen, use the Cleaner #500, ester or cellosolve type solvent, or a mixed solvent of ester and cellosolve type.

b) Use undiluted ink. In case of any viscosity adjustment, use the specified thinner #313.

c) After the surface treatment of printed wiring boards, avoid any hand grease or stain on the boards and immediately print with the ink and cure it.

d) For drying the film after printing, pre-drying temperature is suitable at 75℃, however, the drying condition should be set in advance. Because the temperature depends on shape, heat capacity of a dryer and the number of boards. If the drying is not sufficient, the film is sticky and sticks to the artwork film when in exposure. If the drying temperature is excessively high, it results the defective development.

e) Use this ink in places to avoid any fire.

f) Use this ink in a well-ventilated working room.

g) Store this ink in a cool place at below 20℃

5. Experiment data (Reference)

5-1. Properties of cured film of FINEDEL DSR-330S50-99MBK

Table 2 Hardened film performance of FINEDEL DSR-330S50-99MBK

Items	Performance	Test methods (Test conditions)
1.Pencil Hardness	6 H	JIS C 5012-1993 8.6.3 Pencil hardness
	6 H	IPC-SM-840C 3.5.1/TM 2.4.27.2
2. Adhesion	100/100	JIS C 5012-1993 8.6.2 Cross-cut Tape Test
	Passed	IPC-SM-840C 3.5.2.1/TM 2.4.28.1 No peeling shall occur on copper or boards.
3. Machinability	Passed	IPC-SM-840C 3.5.3 No crack or burst greater than those observed on the base material shall be caused on the film when drilling, sawing and press punching is performed.
4. Resistance to solvents and cleaning agents	No abnormality on the film	IPC-SM-840C 3.6.1.1 No blister, peeling, swelling or discoloration shall occur on the film: Isopropanol Room temperature 2 minutes
		3-methoxy-propanol acetate Room temperature 60 minutes
5.Resistance to chemicals	No abnormality on the film	No abnormality shall occur on the film. 10 % sodium hydroxide Room temperature 30 minutes
6. Adhesion immediately after boiling	No abnormality on the film	100℃ 5 hours, Observe the appearance after tape peeling.
7. Adhesion after treatment with pressure cooker	No abnormality on the film	121℃ 0.2 MPa 5 hours, Observe the appearance after tape peeling.
8. Solderability and Resistance to solder	Passed	IPC-SM-840C 3.7 Solderability 3.7.1 No bad influence shall be caused on the solderability of the spot to be soldered when soldering is performed in accordance with J-STD-003.
	Passed	IPC-SM-840C 3.7 Resistance to soldering 3.7.2 No solder shall adhere to the film after soldering (260±5℃, 10±1 seconds.) under the specified conditions (J-STD-004: M type flux, J-STD-006; Sn60 or Sn63 solder).
9. Solder heat resistance *1	No abnormality on the film	JIS C 5012-1993 10.5.1 Solder Bath Method No blister or peeling shall occur on the film. Observe the appearance after tape peeling Flux: SOLDERITE MH-820V Solder temperature 260℃, 10 seconds, dipping 5 times

Items	Performance	Test methods (Test conditions)
10. Resistance to hot air leveler	No abnormality on the film	No blister or peeling shall occur on the film. Observe the appearance after tape peeling. Flux: W-2304 Solder temperature 240℃, dipping time 4 seconds, hot air temperature 220℃, pressure 0.38 MPa, dipping 3 times
11. Dielectric strength	40 DC V/μm (1000DCV/mil)	IPC-SM-840C 3.8.1/TM2.5.6.1 20 DC V/μm or over (500 DC V/mil or over)
12. Volume resistivity	1×10^{15} Ωcm	IPC-TM-650 2.5.17.1
13. Surface resistance	5×10^{15} Ω	IPC-TM-650 2.5.17.1
14. Insulation resistance	Before soldering 1×10^{13} Ω After soldering 1×10^{12} Ω	IPC-SM-840C 3.8.2/TM 2.6.3.1 (IPC B pattern) More than 500 MΩ for before and after soldering.
15. Moisture and insulation resistance	5×10^{8}Ω	IPC-SM-840C 3.9.1/TM 2.6.3.1 Class H 25~65℃ 85%RH 6+2/3 days (Bias voltage; 50 V and test voltage; 100 V) More than 100 MΩ
16. Electrochemical migration	No occurrence 1×10^{11}Ω	IPC-SM-840C 3.9.2/TM 2.6.14 Class H 85℃ 90%RH 168 h (Bias voltage; 10 V and test voltage; 10 V) No occurrence of migration and the insulation resistance shall be higher than 2 MΩ
17. Dielectric loss tangent (tanδ)	0.03	JIS C 6481-1996 5.12.2 / IPC-TM-650 2.5.5.4 Impedance analyzer (4192A LF manufactured by Yokogawa Hewlett Packard was used) 1 MHz
18. Permittivity (ε)	3.5	JIS C 6481-1996 5.12.2 / IPC-TM-650 2.5.5.4 Impedance analyzer (4192A LF manufactured by Yokogawa Hewlett Packard was used) 1 MHz
19. Sensitivity	Step 10	500 mJ/cm^2 (above the resist surface), Kodak step tablets 21 step
20. Resolution	40 μm	500 mJ/cm^2 (Above the resist surface) Film thickness: wet 35 μm Test board for QFP, Copper foil thickness: 50 μm
21. Resistance to gold plating *2	No abnormality in cured film No abnormality in cured film	No blistering, peeling, swelling or discoloration shall occur on the film. 1) Electrolytic gold plating Au:1.5μm, appearance after peeling off tape. 2) Non-electrolytic gold plating Ni:3μm,Au:0.05μm, appearance after peeling off tape. Ni:5μm,Au:0.05μm, appearance after peeling off tape. Ni:7μm,Au:0.05μm, appearance after peeling off tape. 3) Electrolytic gold plating after Non-electrolytic gold plating Ni:3μm,Au:0.03μm + 0.7μm, appearance after peeling off tape.

*1 Abnormality may occur on the film, depending on the type of flux used. Use, therefore, after performing tests in advance.

*2 Abnormality may occur on the film, depending on conditions of plating bath. Use, therefore, after performing tests in advance.

5-2 Relationship between viscosity and temperature.

Measuring instrument : Brookfield HBT
Spindle No.4

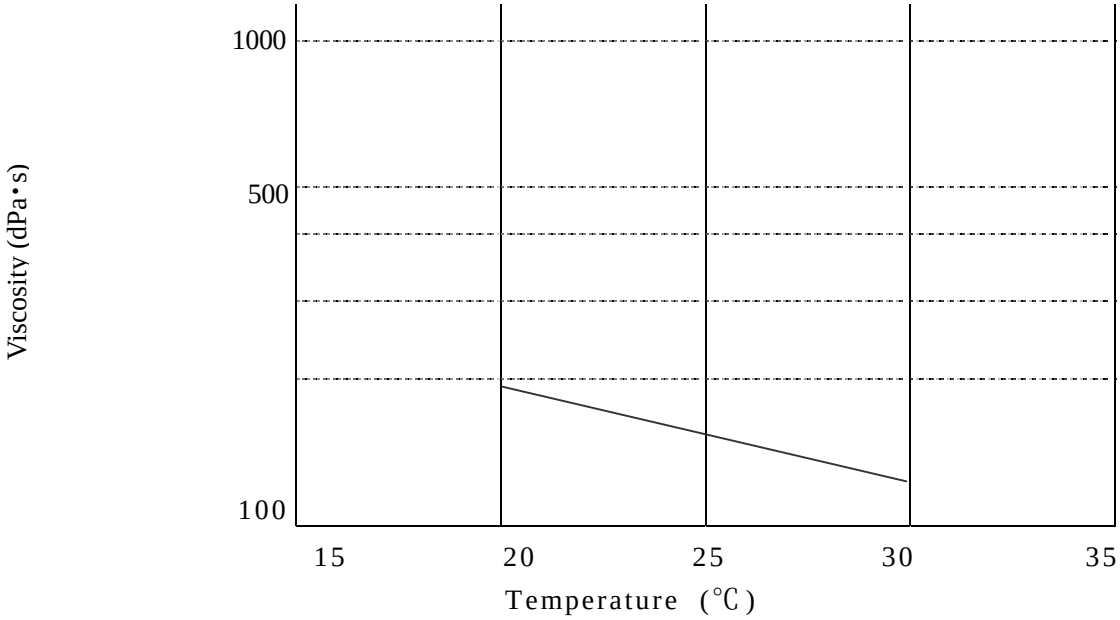

Fig.1 Relationship between viscosity and temperature

5-3 Relationship between viscosity and addition of thinner #313

Measuring instrument : Brookfield HBT
Spindle No.4

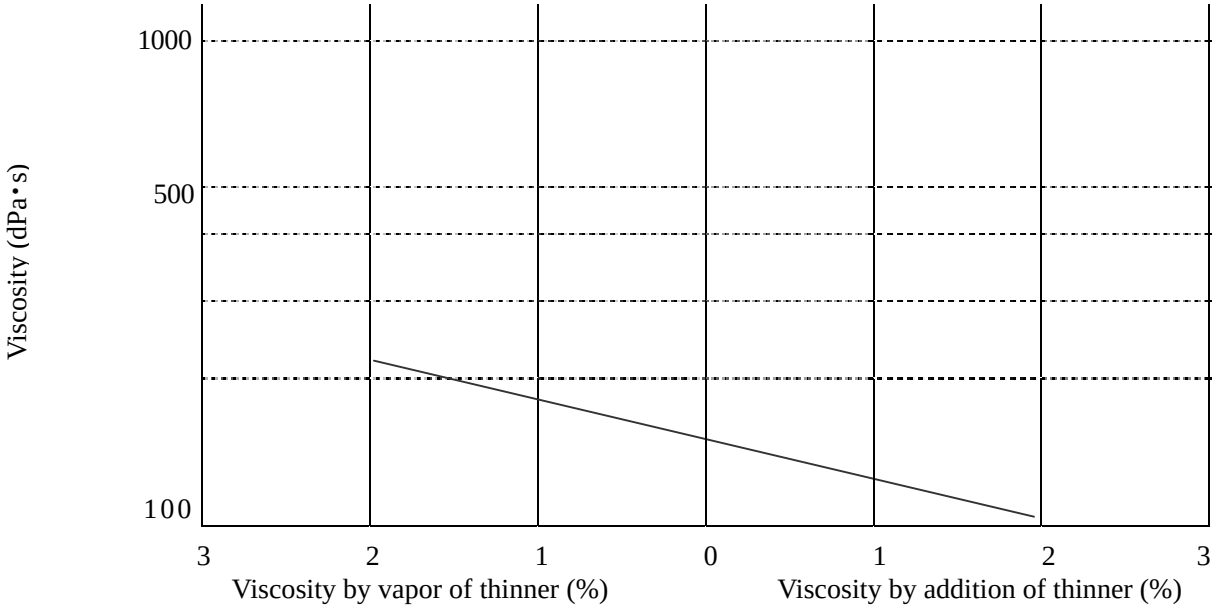

Fig.2 Relationship between viscosity and addition of thinner #313

5-4 Pre-drying

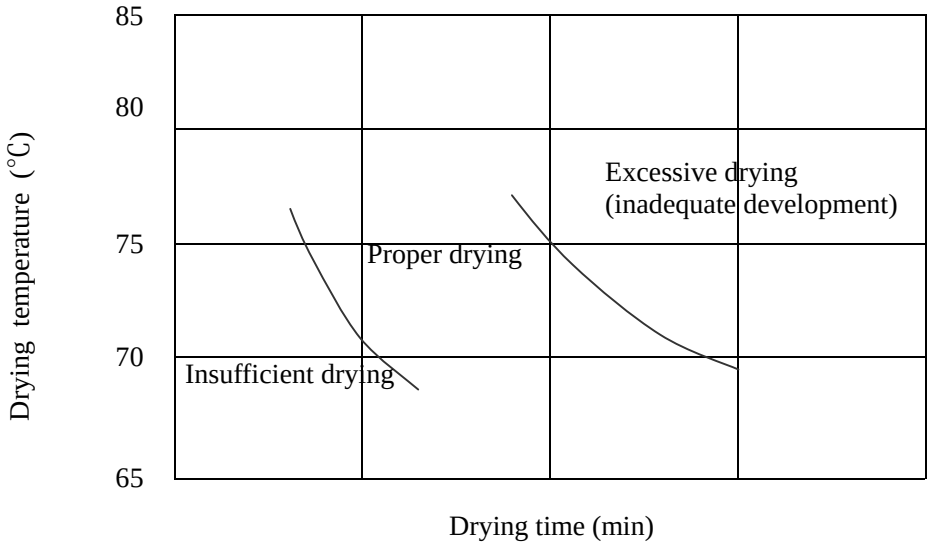

Fig.3 Pre-drying temperature, drying time and the dried condition of the film

Note: Test results shown are based on experiments conducted at Tamura Kaken laboratories. However, no guarantee is given for the numeric values.