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**THERMALLY CURABLE HOLE PLUGGING INK
(1-COMPONENET TYPE)**

THP-100 DX1

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1. Features

THP-100DX1 is a fully epoxy-based, one-component and thermal curable permanent hole plugging ink. This product features an extra low shrinkage after curing, suitable for plugging through-holes of thick panel. Electroless Cu plating can be processed over the plugged via holes for free pattern designing.

2. Characteristics

Product Name	THP-100DX1
Color	White
Viscosity	800 +/- 200dPa·s (E-type viscometer 5rpm / 25°C)
Standard cure condition	Precure: 130°C 45min. (Hot air convection oven) Postcure: 150°C 60min. (Hot air convection oven)
Shelf life *	2 month after production (Stored at dark place, 10°C or below)
Pot life (In room temp, after opening)	8 hours after

* Provisional value, not final.

3. Process

Package Opening	Wait until the package becomes ambient temperature.
Stirring	*20min. by hand or butterfly mixer at low rpm avoiding bubble trapping inside (desirable to use vacuum mixer).
Panel	Must be panel-plating is completed.
Pre-treatment	Remove the oxidization of copper surface.
Printing	#100-mesh Tetron screen (#80-200) Special squeegee as shown in the attached sheet is recommended.
Precure	130°C 45min (130°C 45~60min. in hot air convection oven) in case the panel thickness more than 0.8mm, step cure by 100°C 20min / 130°C 45min should be processed.
Surface scrubbing	#320 buff for hole plugging ink (#220-320)
Post cure	150°C 60min (150°C 30~60min. in hot air convection oven)

4. Attention

- * Hole plugging process must be done after panel plating. Patterning (Circuitization) follows hole plugging.
- * Workshop is desirable to be a clean room and ambient temperature should be kept 20–25°C, 50–60%RH.
- * Open a can after the ink becomes room temperature, stir ink well before use.
- * Postcure condition should be fixed by your own confirmation tests. Over cure or insufficient cure may cause the deterioration of final properties.
- * Set cure conditions after testing because they are influenced according to the type of your oven, quantity of the panels you put in the oven and so on. Insufficient and/or over curing conditions may deteriorate end properties.
- * Screen can be cleaned with ether or ester solvent.

5. End Properties

Test item	Test method	Result
Adhesion	Taiyo internal method Cross hatch taping	100 / 100
Pencil hardness	Taiyo internal method No scratch on the copper	9H
Heat resistance	After plugging T/H, coated the surface with solder resist. Check blistering of solder resist. 260°C 20sec × 2cycles of flow solder dipping using rosin type flux.	Pass
Water absorption	Water absorption rate after PCT (121°C, 100% /12h)	0.9%
	Pure water dipping 23°C /24h	0.6%
Tg CTE	TMA tensile method (X, Y direction) Tg $\alpha 1 / \alpha 2$	160°C 32/115ppm
	TMA expansion method (Z direction) Tg $\alpha 1 / \alpha 2$	155°C 32/81ppm
Peel strength	Vertical direction: 50mm/min.	Minimum 5N/cm

- * The all test data mentioned in this technical data sheet based on our laboratory tests and just for your reference, not to guarantee the same results as yours.
- A. All chemicals in general may have unknown harmful effects. Your highest caution and care is required for handling. For the detail, refer to SDS.
- B. 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, Phthalic esters(DEHP, DBP, , BBP, DIBP).

Permanent Hole Plugging Ink / Cross Section

THP-100 DX1

Test Panel: Taiyo Inhouse Test Board (T= 1.6mm, T/H diameter 0.3mm)

Sample Mfg. Method:

Hole plugging (PET 100 mesh, Dot screen printing (1-stroke))

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Precure (Hot air convection oven 100°C 30min.→ 130°C 45min.)

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Buff scrubbing (Buff for resin scrub #320 x 2 rolls)

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Postcure (Hot air convection oven 150°C 60min.)

- After postcure, observed the cross section by SEM as the picture shown below.

