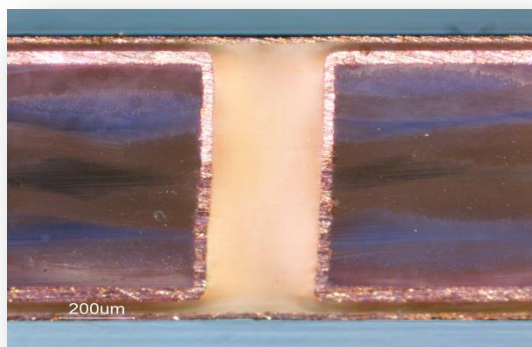








THP-100DX1 SP **(UL Name: THP-100DX)**



THP-100DX1 SP after copper plating



THP-100DX1 SP in 1 kg containers

-  **Available in a 1 kg containers**
-  **One-component Thermally Cured Hole Fill Material**
-  **Very Low Shrinkage**
-  **RoHS Compliant**
-  **High PCT and Thermal Resistance**
-  **Halogen-Free**

PROCESSING PARAMETERS FOR THP-100DX1 SP

THP-100DX1 SP is a single-component, thermally curable, permanent hole-plugging material that is applied by Automatic Filling Equipment with an air-free packaged cartridge or larger container for screen printing application. This product has extremely low shrinkage after cure, which enables the plugging of plated through holes of thick boards. It can be used for board with cover plating feature. This product requires mechanical brushing after cure to remove excess material at the surface of the hole. All Taiyo America products comply with the Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the Restriction of the use of certain Hazardous Substances (RoHS) in electrical and electronic equipment.

PRODUCT STORAGE

THP-100DX1 SP is supplied in a 1 & 5 kg containers. It needs to be stored frozen at or below 14°F (-10°C) in accordance to our warranty. Other storage guidelines are listed below:

| Storage Temperature | Recommended Maximum Storage Days |
|-------------------------------|----------------------------------|
| Freezer: 14°F (-10°C) | 365 |
| Refrigerated: 41°F (5°C) | 180 |
| Room Temperature: 68°F (20°C) | 30 |

PRE-CLEANING

Prior to hole filling, ensure that the hole is free of oxidation and contaminants and is dry to increase adhesion. A 5-7% sulfuric or hydrochloric acid wash can be used to prepare the surface prior to application. Hold time after cleaning the holes should be held to a minimum to reduce the oxidation of the copper surfaces.

HOLE FILL APPLICATION

THP-100DX1 SP needs to be at room temperature prior to filling holes. A minimum of 1 hour is need after removing from the freezer.

Method: Screen Printing

THP-100DX1 SP can be screened by hand or by automatic equipment. The mesh size should range from 80 – 200 tpi. Use a soft squeegee with high printing pressure and slow printing speed to reduce the amount of air pushed into the hole. A beveled squeegee can also be used with high printing pressure and slow printing speed.

PRELIMINARY CURE

The preliminary cure is used to “set up” the **THP-100DX1 SP** for planarization through a scrubber. Recommended conditions for the preliminary cure is:

- Oven Temperature: 125 – 130°C (257 -265°F)
- Dwell Time: 40 – 50 minutes

PROCESSING PARAMETERS FOR THP-100DX1 SP

PLANARIZATION To remove the excess **THP-100DX1 SP** that is present on the panel a sanding process needs to be performed. The sanding will provide a planar surface for the subsequent plating process. The recommended grit for the planarization process is 320.

Note: For customers with automated planarization equipment it may be possible to eliminate the 'Preliminary Cure' and to fully cure **THP-100DX1 SP** before planarization.

FINAL CURE **THP-100DX1 SP** requires a thermal cure to insure optimal final property performance. Thermal curing can be done in a batch oven or conveyORIZED oven.

- Temperature: 150°C (300°F)
- Time at Temperature: 60 minutes

WARRANTY PERIOD (SHELF LIFE): 12 Months from Production Date if stored at or below 14°F (-10°C)

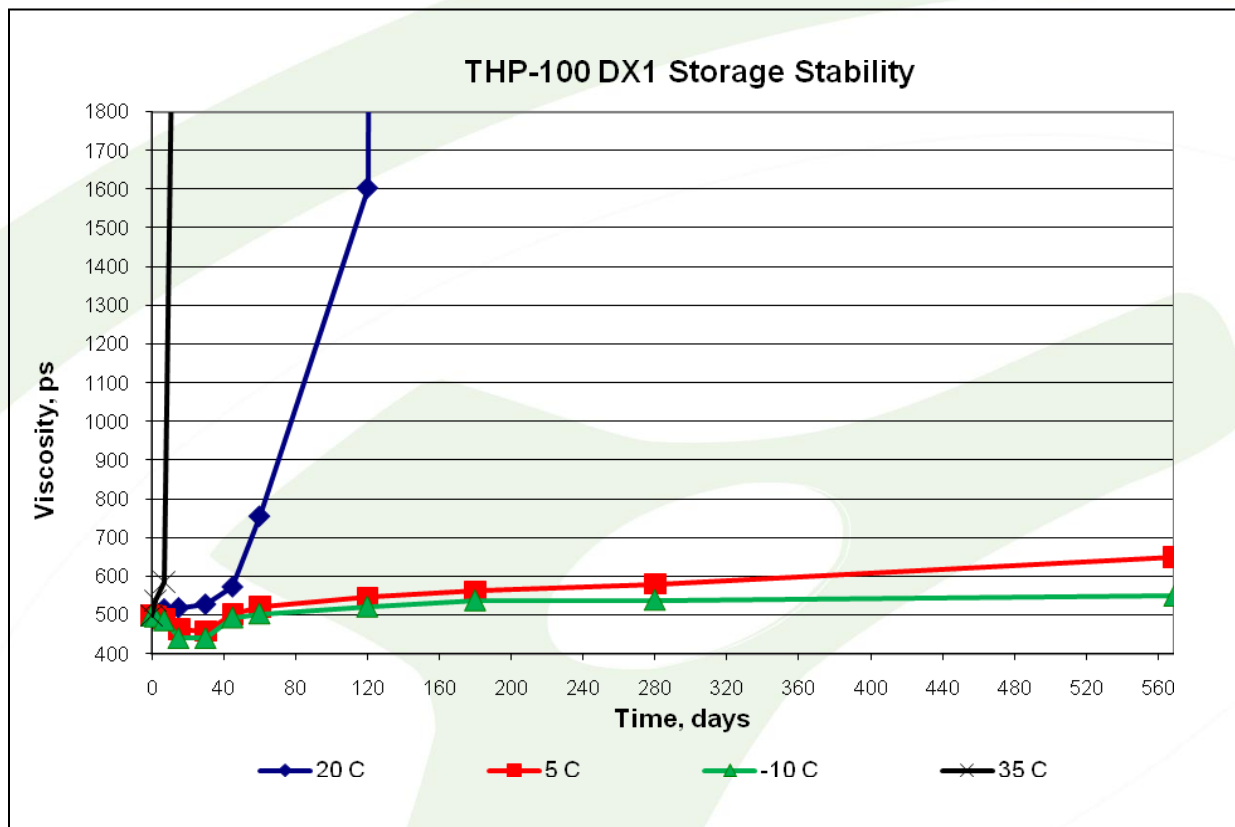
FINAL PROPERTIES FOR THP-100DX1 SP

| Test | Results |
|---|---|
| Color | Beige |
| Adhesion cross cut | 100/100 |
| Pencil Hardness | 7H |
| Halogen Level | 247 ppm |
| Outgassing by ASTM E 595 (TML <1.0% and CVCM <0.1%) | TML = 0.27% - Pass CVCM = 0.01% - Pass |
| Dissipation factor measured at 1 MHz, at room temperature, after the humidity cycling of 25 to 65 °C cycles, 90 %RH, 7 days | Initial: 0.02 Conditioned: 0.03 |
| Solder Resistance Rosin Flux, 260°C/20secs/2cycles | Pass |
| Water Absorption - PCT 120°C/100%RH/12hrs | 0.9% |
| Water Absorption – DI water immersion for 24 hours at 23°C | 0.6% |
| T(g) – TMA Tensile Method | 160°C |
| CTE – TMA Tensile Method (α_1/α_2) | 32/115 ppm |
| T(g) – TMA Expansion Method | 155°C |
| CTE – TMA Expansion Method (α_1/α_2) | 32/81 ppm |
| Thermal Conductivity | 0.58W/mK |
| Peel Strength – Vertical direction, 50 mm/min | 5 N/cm minimum |

STORAGE CONDITION RECOMMENDATIONS

THP-100DX1 is a highly-reactive, one-part epoxy material and, as such, the viscosity stability is greatly affected by the storage temperature. The table and chart below are intended as a guide to the user, and do not constitute or imply warranty of the product under each condition shown.

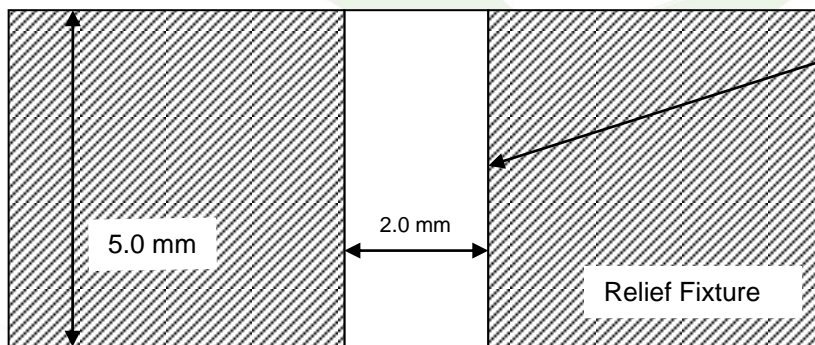
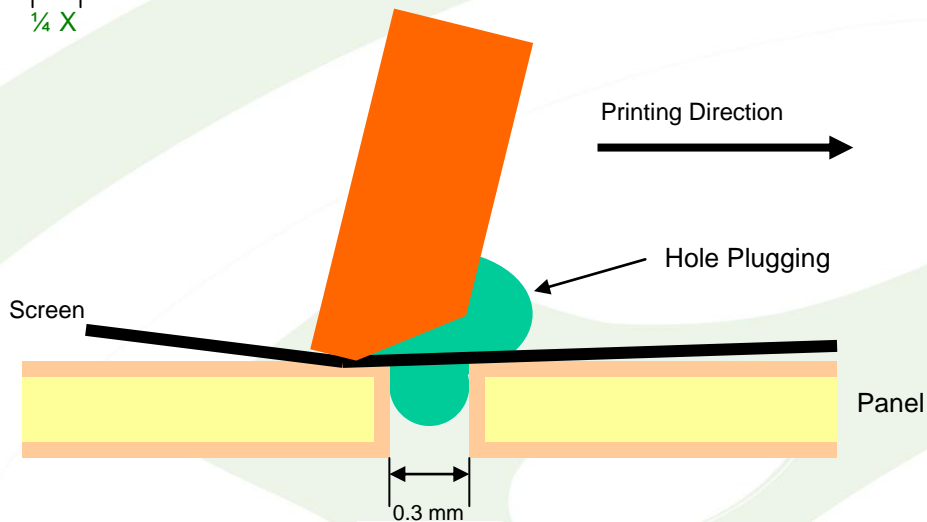
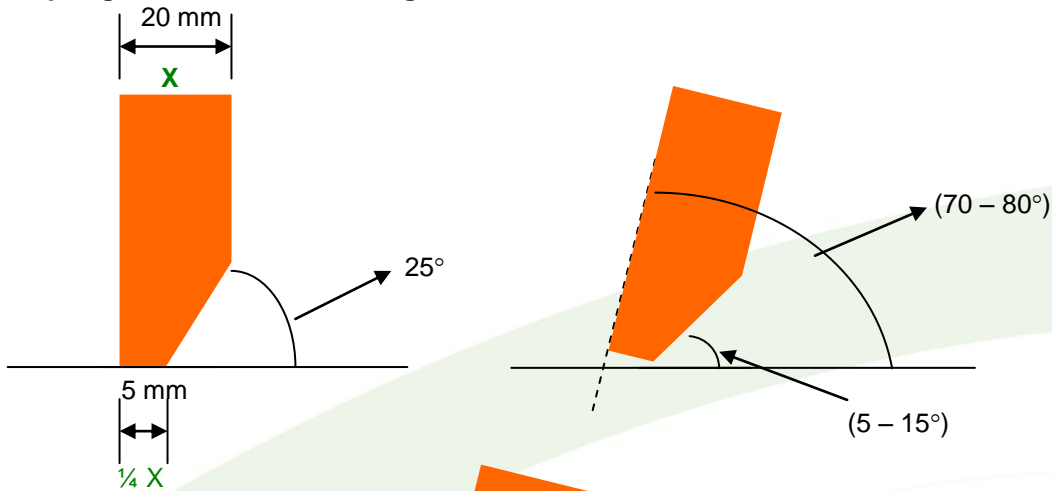
| Storage Temperature | Shelf Life (Days) |
|---------------------|-------------------|
| Room Temp. (20°C) | 30 |
| Refrigerated (5°C) | 180 |
| Frozen (-10°C) | 365 |



Taiyo America, Inc. (TAIYO) warrants its products to be free from defects in materials and workmanship for the specified warranty period (**THP-100DX1 SP Warranty period is 12 Months**) provided the customer has, at all times, stored the ink at a temperature of 14°F (-10°C) or less. TAIYO accepts no responsibility or liability for damages, whether direct, indirect, or consequential, resulting from failure in the performance of its products. If a TAIYO product is found to be defective in material or workmanship, its liability is limited to the purchase price of the product found to be defective. TAIYO MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND MAKES NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR ANY PARTICULAR PURPOSE. TAIYO'S obligation under this warranty shall not include any transportation charges or costs of installation or any liability for direct, indirect, or consequential damages or delay. If requested by TAIYO, products for which a warranty claim is made are to be returned transportation prepaid to TAIYO'S factory. Any improper use or any alteration of TAIYO'S product by the customer, as in TAIYO'S judgment affects the product materially and adversely, shall void this limited warranty.

Screen Printing Set Up with Beveled Squeegee

Squeegee Dimensions and Angle

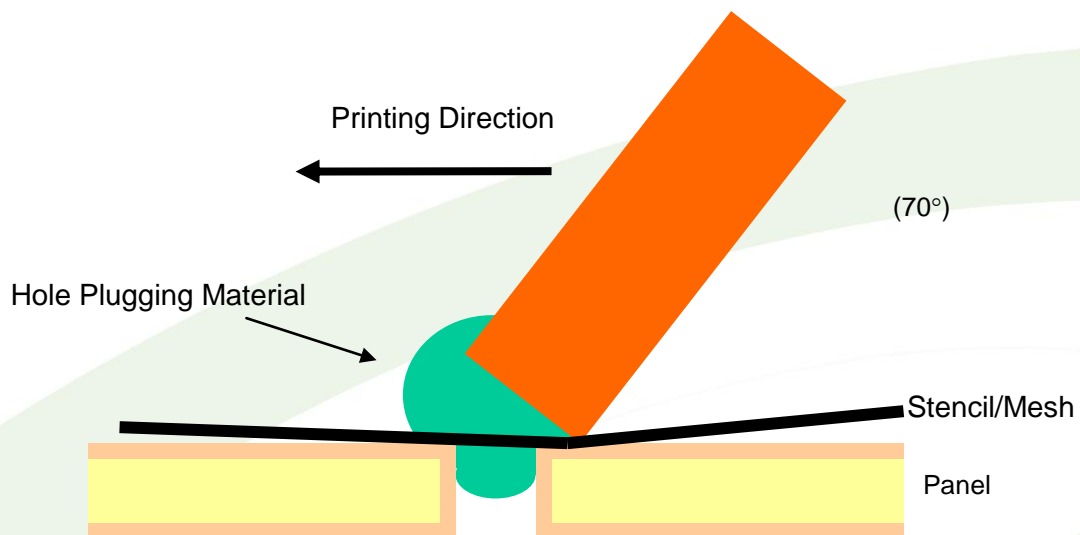


Relief holes should be drilled through the thickness of the fixture.

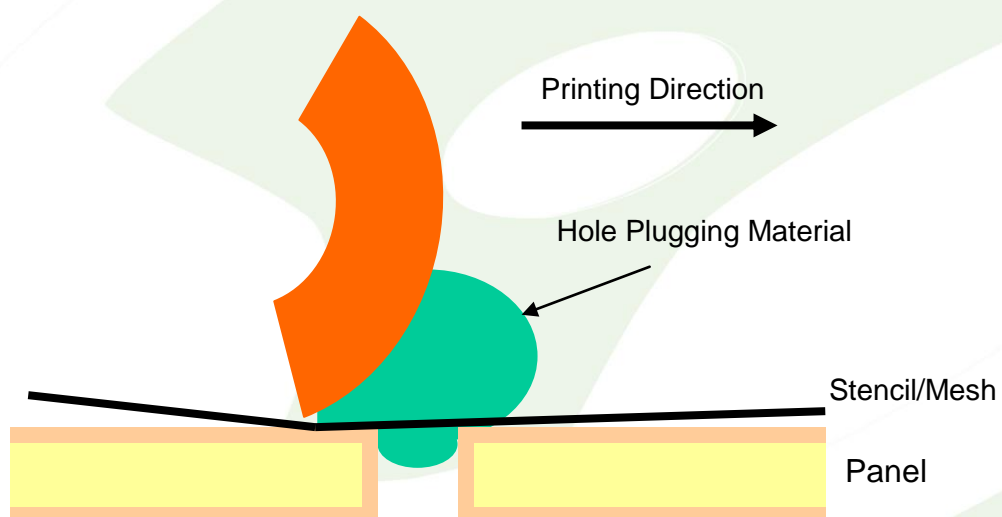
The fixture may be "vented" on the underside by placing a layer of screen mesh between the fixture and the bed or screening table.

Screen Print Set Up with Straight Squeegee





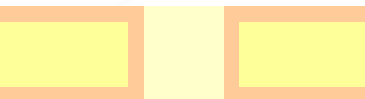
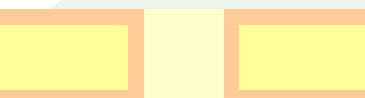


Screen Printing (Pushing Method)



Screen Printing (Plow Method)



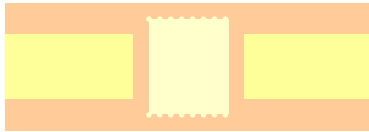
Hole Plugging Process for THP-100DX1 SP

| | | |
|---------------------------|---|---|
| Panel Selection |  | Plated through hole after copper plating |
| Surface Treatment |  | Chemical or Mechanical Scrub with water rinse and dry |
| Application Method |  | Screen using squeegee set up and mesh size of 80 – 200 |
| Pre-Cure |  | Temperature: 130°C (266°F) Time: 45 – 60 minutes |
| Scrubbing |  | Buff Scrubbing using #220 - #320 grit |
| Final Cure |  | Temperature: 150°C (300°F) Time: 60 minutes |
| Micro Etching |  | Prepare surface of copper and hole plug material for copper plating |
| Electroless Copper |  | Plate copper over hole plug and build up copper thickness |

TECHNICAL DATA SHEET

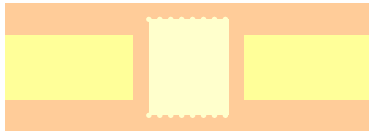
Hole Plugging Process for THP-100DX1 SP (continued)

Annealing



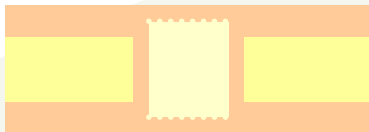
Temperature: 100°C (212°F)
Time: 30 minutes

Electrolytic Copper Plating



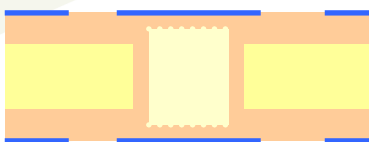
Build up copper thickness to desired level

Baking



Temperature: 150°C (300°F)
Time: 60 minutes

Etch Resist



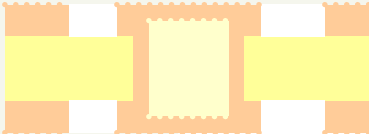
Coat surface with etch resist to designs copper pads and traces

Etching/Stripping



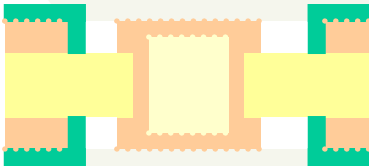
Etch copper then strip etch resist

Surface Treatment



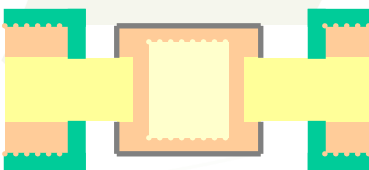
Clean surface for solder mask application

Solder Mask



Coat with Solder Mask. See Taiyo for solder mask choices.

Copper Protection



Protect copper with metal plating such as Ni/Au, Ag, and Sn or by HASL or OSP.



Always on your side.