



BY TAIYO

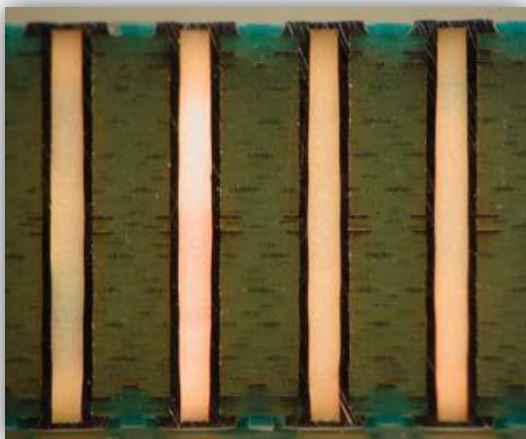
## THP-100DX1 Series

- **Designed specifically for hole filling equipment to fill small vias without voids**
- **Available in cartridges and 1 Kg cans**
- **THP-100DX1 (HTG) has a High Tg (173°C) and low CTE (19/56ppm)**
- **Very Low Shrinkage and Ease of Planarization**
- **No Chemical Attack through Desmear**
- **Halogen Free and RoHS Compliant**
- **High PCT and Thermal Resistance**
- **THP-100DX1 (HTG) has a 1 year shelf life at 5°C**
- **THP-100DX1 VF and VF (HV) have a 1 year shelf life at -10°C**

FILLING YOUR CHALLENGES ONE VIA AT A TIME



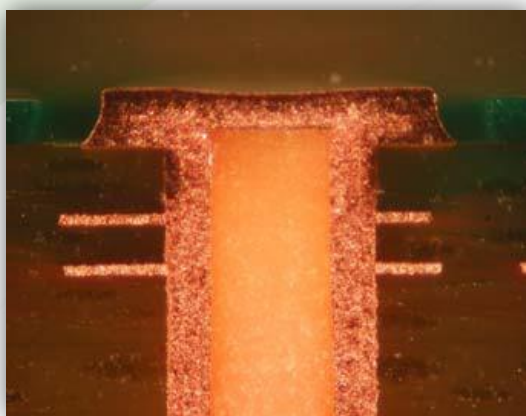
## THP-100DX1 SERIES



Board Thickness = 120 mils  
Hole Diameter = 14 mils



THP-100DX1 Series in 0.5 kg  
cartridges and 1 kg containers



**THP-100DX1 Series** products are single-component, thermally curable, permanent hole filling materials that are applied by Hole Filling Equipment. They are available in packaged cartridges or larger containers. These products have extremely low shrinkage after cure, which enables the filling of plated through holes in thick boards. THP-100DX1 products work well in applications 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.

# TECHNICAL DATA SHEET



## PRODUCT STORAGE

THP-100DX1 Series products are supplied in cartridges or larger 1 kg containers.

THP-100DX1 VF & THP-100DX1 VF(HV) versions need to be stored frozen at or below 14°F (-10°C) to maintain a 1 year shelf life. THP-100DX1 (HTG) needs to be stored frozen, or at or below 41°F (5°C) to maintain a 1 year shelf life.

Other storage guidelines are listed below:

Storage Temperature	Maximum Storage	
	THP-100DX1 VF & THP-100DX1 VF(HV)	THP-100DX1 (HTG)
Freezer: 14°F (-10°C)	365 days	365 days
Refrigerated: 41°F (5°C)	180 days	365 days
Room Temperature: 68°F (20°C)	30 days	30 days

## PRE-CLEANING

Prior to via filling, ensure that the vias are free of contaminants and oxidation 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 vias should be held to a minimum to reduce the oxidation of the copper surfaces.

## VIA FILL APPLICATION

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

Method: Hole Filling Equipment

These products were specifically designed for via filling equipment to fill small vias with no voids. The following chart has guidelines for filling holes.

After filling the vias, the scavenger is used to remove excess via filling material from the panel.

Board Thickness	39 mils	62 mils	93 mils	120 mils
Head Pressure (psi)	30-50	30-50	30-50	30-50
Past Pressure (psi)	15-30	15-30	15-30	15-30
Traverse Speed Down (%)	10-20	5-15	3-10	2-8
Traverse Speed Down (mm/min)	190-230	140-215	90-165	75-115
Delay Time for Fill (sec)	4-10	4-10	4-10	4-10

# TECHNICAL DATA SHEET



## OPTION 1

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

- Oven Temperature: 125 – 130°C (257 -265°F)
- Dwell Time: 40 – 70 minutes

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**PLANARIZATION** To remove the excess **THP-100DX1** 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** before planarization.

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**FINAL CURE** **THP-100DX1** 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

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## OPTION 2

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

- Oven Temperature: 125 – 130°C (257 -265°F)
- Dwell Time: 40 – 70 minutes

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**FINAL CURE** **THP-100DX1** 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

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**PLANARIZATION** To remove the excess **THP-100DX1** 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.

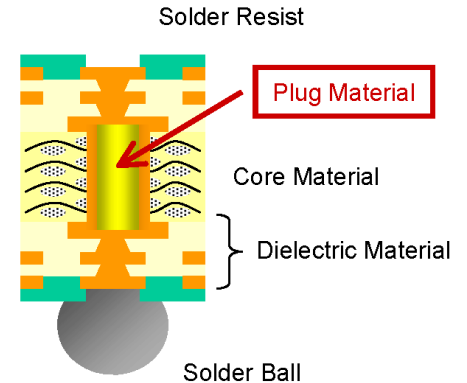
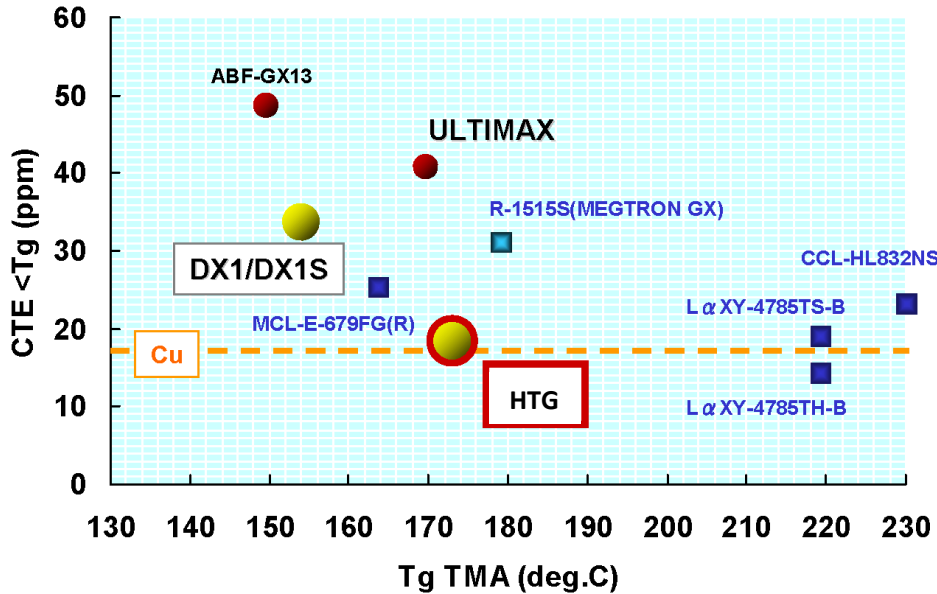
**Note:** For customers with automated planarization equipment it may be possible to eliminate the ‘Preliminary Cure’ and to fully cure **THP-100DX1** before planarization.

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## FINAL PROPERTIES FOR THP-100DX1 SERIES

TEST	RESULTS	
	THP-100DX1 VF & THP-100DX1 VF(HV)	THP-100DX1 (HTG)
Color	Beige	White
Density	1.64 g/cm <sup>3</sup>	1.97 g/cm <sup>3</sup>
Adhesion cross cut	100/100	100/100
Pencil Hardness	7H	8H
Dissipation factor measured at 1 MHz, at room temperature, after humidity cycling of 25 to 65°C cycles, 90% RH, 7 days	Initial: 0.02 Conditioned: 0.03	Initial:0.02 Conditioned:0.03
Solder Resistance Rosin Flux, 260°C/20secs/2cycles	Pass	Pass
Water Absorption - PCT 120°C/100%RH/12hrs	0.9%	0.9%
Water Absorption – DI water immersion for 24 hours at 23°C	0.6%	0.07%
Young's Modulus	4.5 GPa	4.5 GPa
Tensile Strength	40 MPa	40 MPa
Elongation	1.5%	1.5%
Poisson Ratio	0.34	0.34
T(g) – TMA Tensile Method	160°C	173°C
CTE – TMA Tensile Method ( $\alpha_1/\alpha_2$ )	32/115 ppm	19/56 ppm
T(g) – TMA Expansion Method	155°C	170°C
CTE – TMA Expansion Method ( $\alpha_1/\alpha_2$ )	32/81 ppm	19/56 ppm
Decomposition Temperature	356°C	356°C
Thermal Conductivity	0.58 W/mK	0.71 W/mK
Dielectric Constant	3.6 @ 1 GHz	3.7 @ 1 GHz
Dissipation Factor	0.013 @ 1GHz	0.013 @ 1GHz
Peel Strength – Vertical direction, 50 mm/min	5 N/cm minimum	>5 N/cm minimum
Halogen Level	247 ppm	582 ppm
Outgassing by ASTM E 595 (TML <1.0% and CVCM <0.1%)	TML = 0.27% Pass CVCM = 0.01% Pass	TML = 0.56% Pass CVCM = 0.01% Pass WVR = 0.47% Pass
UL Name:	THP-100DX	THP-100HTG

## Positioning of THP-100DX series



- Plug Material
- Dielectric Material
- Core Material

\* Core board Property : Quoted from Catalog  
CTE < Tg : Z direction

\* Plug Material: X-Y direction TMA

\* Cu CTE : X-Y direction TMA  
Copper foil → GTS-MP-35um (Furukawa Circuit Foil)  
Electro Plating → ATOTECH ~30um

**Warranty Period for THP-100DX1 VF & THP-100DX1 VF(HV): 12 Months from Production Date if Stored at or below -10°C (14°F).**

**Warranty Period for THP-100DX1 (HTG): 12 Months from Production Date if Stored at or below 5°C (41°F).**

Taiyo America, Inc. (TAIYO) warrants its products to be free from defects in materials and workmanship for the specified warranty period (**THP-100DX1 Warranty period is 12 Months**) provided the customer has, at all times, stored the THP-100DX1 VF and THP-100DX1 VF (HV) versions at a temperature of 14°F (-10°C) or less, and the THP-100DX1 HTG version at 41°F (5°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.