TECHNICAL DATA SHEET

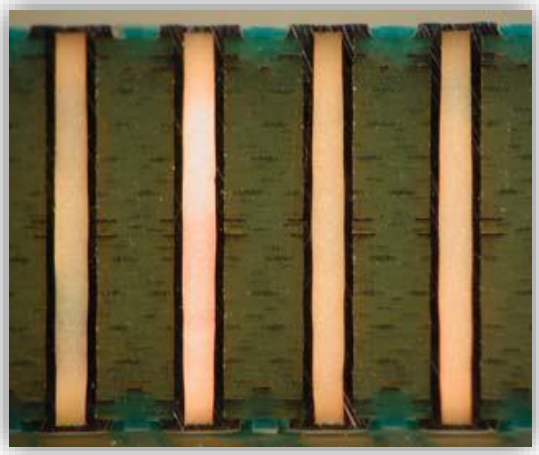
TAIYO THP-100DX1 Series

- **Designed specifically for hole filling equipment to fill small vias without voids**
- **Available in 500-gram Cartridges and 1 Kg Container**
- **THP-100DX1 (HTG) has a High Tg (173°C) and low CTE (19/56ppm)**
- **100% Solids**
- **Very Low Shrinkage and Ease of Planarization**
- **No Chemical Attack through De-smear**
- **Halogen Free and RoHS Compliant**
- **High PCT and Thermal Resistance**
- **THP-100DX1 VF, VF (HV), and HTG have a 1-year shelf life at -10°C**
- **Data for IPC-4104 listed in Final Properties.**

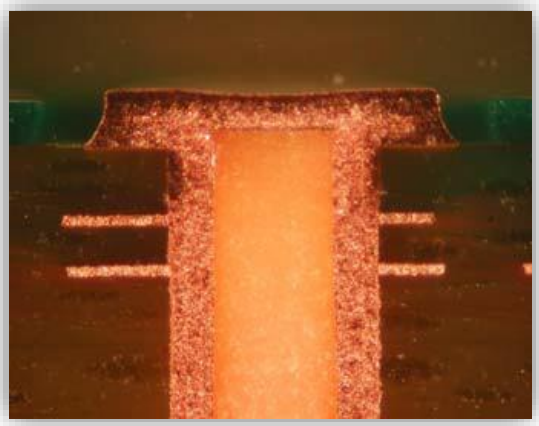
Revised May 9, 2025

TECHNICAL DATA SHEET

THP-100DX1 SERIES



Board Thickness = 120 mils
Hole Diameter = 14 mils



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

THP-100DX1Series 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), & THP-100DX1 (HTG) versions need to be stored frozen at or below 14˚F (-10˚C) to maintain a 1-year shelf life.

The product needs to be shipped in a controlled manner with temperatures not to exceed 20ºC for a duration of 5 days.

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	180 days
Room Temperature: 68˚F (20˚C)	30 days	30 days

PRE-CLEANING

Prior to via filling, ensure that the vias are free of contaminates 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. When removing the cartridge from the freezer, thaw them standing upright so that any air can rise to the top. Remove the red tip and push the black plunger so that the hole fill material fills the threaded neck and displaces any air prior to placing it into the hole filling equipment.

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
Paste 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

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

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.

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

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

FINAL CURE

THP-100 DX1 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

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.

FINAL PROPERTIES FOR THP-100DX1 SERIES

TEST	Test Method	RESULTS	
		THP-100DX1 VF & THP-100DX1 VF (HV)	THP-100DX1 (HTG)
Color	Visual	Beige	White
Density	Internal	1.64 g/cm^3	1.97 g/cm^3
Adhesion crosscut	Internal	100/100	100/100
Pencil Hardness	ASTM D3363	7H	8H
Dissipation factor measured at 1 MHz, at room temperature, after humidity cycling of 25 to 65°C cycles, 90% RH, 7 days	Internal	Initial: 0.02 Conditioned: 0.03	Initial:0.02 Conditioned:0.03
Solder Resistance Rosin Flux, 260°C/20secs/2cycles	J-STD-003	Pass	Pass
Water Absorption - PCT 120°C/100%RH/12hrs	Internal	0.9%	0.9%
Water Absorption – DI water immersion for 24 hours at 23°C	Internal	0.6%	0.07%
Young's Modulus	IPC-TM-650 Method 2.4.18.3	4.5 GPa	4.5 GPa
Tensile Strength	IPC-TM-650 Method 2.4.18.3	40 MPa	40 MPa
Elongation	IPC-TM-650 Method 2.4.18.3	1.5%	1.5%
Poisson Ratio	Internal	0.34	0.34
T(g) – TMA Tensile Method	IPC-TM-650 Method 2.4.24.5	160°C	173°C
CTE – TMA Tensile Method (α1/α2)	IPC-TM-650 Method 2.4.24.5	32/115 ppm	19/56 ppm
T(g) – TMA Expansion Method	IPC-TM-650 Method 2.4.24.5	155°C	170°C
CTE – TMA Expansion Method (α1/α2)	IPC-TM-650 Method 2.4.24.5	32/81 ppm	19/56 ppm
Decomposition Temperature- TGA, 5% weight loss	IPC-TM-650 Method 2.4.24.6	356°C	356°C
Thermal Conductivity	ASTM E1461	0.58 W/mK	0.71 W/mK
Dielectric Constant	Internal	3.6 @ 1 GHz	3.7 @ 1 GHz
Dissipation Factor	Internal	0.013 @ 1GHz	0.013 @ 1GHz

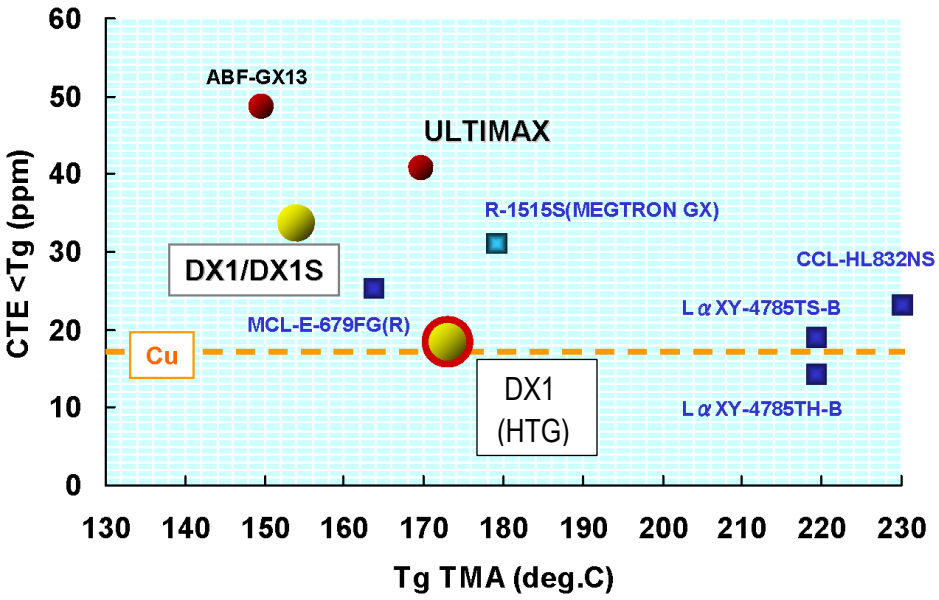
TECHNICAL DATA SHEET

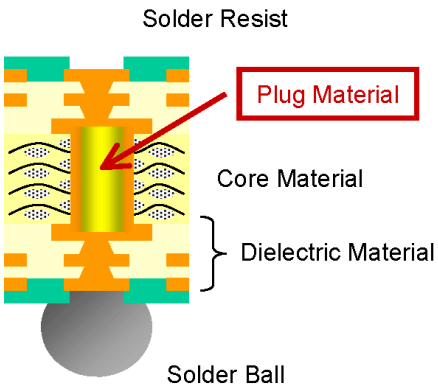
TEST	Test Method	RESULTS	
		THP-100DX1 VF & THP-100DX1 VF (HV)	THP-100DX1 (HTG)
Peel Strength – Vertical direction, 50 mm/min	Internal	5 N/cm minimum	>5 N/cm minimum
Halogen Level	BS EN 14582:2016 IC Method	247 ppm	582 ppm
Outgassing (TML <1.0% and CVCM <0.1%)	ASTM E 595	TML = 0.27% Pass CVCM = 0.01% Pass	TML = 0.56% Pass CVCM = 0.01% Pass WVR = 0.47% Pass
UL Name:		THP-100DX	THP-100HTG

Data for IPC-4104 is listed in the table above.

TECHNICAL DATA SHEET

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

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, THP-100DX1 VF (HV), and THP-100DX1 HTG versions at a temperature of 14˚F (-10˚C) or less. The product needs to be shipped in a controlled manner with temperatures not to exceed 20ºC for a duration of 5 days. 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.