

PRODUCT DESCRIPTION

ORMET 805 is a lead-free conductive paste used to fill plated-through-holes (PTH) in printed circuit boards and semiconductor packages. Use of **ORMET 805** significantly improves the thermal drain properties of the PTH without the high costs associated with plating the holes closed. The innovative metal matrix uses Ormet Circuits' patented Transient Liquid Phase Sintering (TLPS) technology to metallurgically alloy the **ORMET 805** throughout the barrel of the hole and to the plated sidewalls. This continuous connection enhances the integrity and effective thermal conductivity of the PTH. The CTE of sintered **ORMET 805** is closely matched to the copper over a temperature range of 0-250°C. **ORMET 805** enables lead-free metallic filling at temperatures as low as 180°C with a simple squeegee/vacuum table or pressure head installation. After reaction, they are capable of withstanding thermal excursions above lead free SMT profiles. The materials can be brushed or sanded to present a smooth and planar surface to receive the next assembly stage in the PCB fabrication.

TYPICAL PROPERTIES

<u>Property</u>	<u>Test Method</u>	<u>Value</u>
Color 'As-received'	Visual	Copper color
Color 'Post-reaction'	Visual	Grey color¹
Filler Type	Copper Filler and Tin Alloy Filler	
Nominal Particle Size	Hegman Gauge	< 20 microns
Viscosity	Brookfield TE Spindle @ 5 rpm	450 kcps
Thixotropic Index	Ratio of viscosity 1rpm / 10rpm	5
Approximate Specific Gravity		6 grams/cc
Electrical Resistivity	Volume Resistivity 4-point probe	35
Thermal Conductivity	Laser Flash Diffusivity	50 W/mK
CTE	TMA expansion mode	19 ppm/°C
Weight Loss on Cure	TGA	4%
Work Life	Application testing after RT storage	24 hours @ 25°C
Estimated Screen Life	Via fill applications testing	8 hours
Estimated Storage Life		12 months < -10°C

¹ Surface may remain copper color if reacted in air or an atmosphere with sufficient oxygen to prevent fluxing of outer copper particles.

TYPICAL APPLICATIONS

ORMET 805 is used in via fill applications where conventional plated through hole (PTH) are filled and plated over offering a flat surface. **ORMET 805** offers innovative means to existing industry applications.

Some applications that may be candidates for **ORMET 805** include:

- Filling high-aspect ratio holes (down to 50µm in diameter by 400µm deep)
- Enhancing copper-plated PTH structures for heat dissipation.
- Filling via-in-pad through holes for PCB applications.
- Filling through holes in semiconductor packaging applications

MATERIAL DEPOSITION GUIDELINES

ORMET 805 can be applied through a range of techniques. Most frequently **ORMET 805** is applied by using a power squeegee head printing process. The material can also be applied by dispensing or conventional stencil or screening printing. It is recommended that a metal blade squeegee be used during the final printing stroke to fill the via flush with the top of the hole. A second filling step is a good practice for achieving high packing density and a planar hole surface. Vacuum assistance from a vacuum table or similar is also a good practice for ensuring uniform fill. Please refer to Ormet's Applications Guide for additional detail.

SINTERING PROCESS GUIDELINES

	Recommended Profile	Alternate Profiles
Solvent Removal (Drying)	30 minutes @ 95°C	30 minutes @115°C 60 minutes @ 75°C
Sintering	60 minutes @ 190°C	15 minutes @ 210°C

Ormet 802 may be electroplated with copper after sintering. Permanganate desmear and/or electroless copper processes are not necessary prior to electroplating, and may attack the deposit.

STORAGE AND HANDLING

ORMET 805 is supplied in 250 gram jars and a range of cartridge sizes. **ORMET 805** must be stored at -10°C MAX. **ORMET 805** must be stabilized to room temperature for 30 minutes before opening the jars for use.

GENERAL INFORMATION

The Material Safety Data Sheet (MSDS) contains safe handling information for this product. Please read carefully before handling or using this product.

The information provided in this Technical Data Sheet is believed to be correct and reliable; however, Ormet Circuits, Inc. does not assume responsibility for the user's implementation. Ormet Circuits, Inc. specifically disclaims all warranties expressed or implied including warranties for merchantability or fitness for use for a particular purpose, arising from sale or use of our products.

This product is covered by United States and foreign patents, both issued and pending, for the material compositions, applications and techniques for use. See the Ormet website for details patent information.