ORMET CIRCUITS, INC.

Technical Data Sheet

Ormet 400

July 2014

PRODUCT DESCRIPTION

The **Ormet 400** Series are lead-free component attach conductive pastes used in component assembly applications that require high strength at elevated temperature to withstand subsequent assembly operations. **Ormet 400** is designed to drop into existing stencil-deposited SAC solder paste lines, lower-viscosity Ormet 402 is optimized for dispense, and Ormet 406 addresses fine pitch applications with either dispense or stencil print deposition. These materials are also suitable for component assembly for products that will be used in harsh environment applications. The innovative metal matrix utilizes Ormet's patented Transient Liquid Phase Sintering (TLPS) technology to make robust, reliable interconnects. TLPS compounds enable metallic bonding at standard lead-free process temperatures with no remelt below 400°C.

TYPICAL PROPERTIES

Property	Test Method	Value
Color	'As-received' Visual	Copper color
Color	'Post-reaction' Visual	Grey color
Filler	Type	Copper Filler and Tin Alloy Filler
Nominal Particle Size	Hegman Gauge	< 50 microns
Metal loading	Weight percentage	93% (97% net after solvent evaporation)
Viscosity	Brookfield TE Spindle @ 5 rpm	400 kcps
Thixotropic Index	Ratio of viscosity 1rpm / 10rpm	3.8
Specific Gravity	Graduated cylinder	6 grams/cc
Electrical Resistivity	Volume Resistivity 4-point probe	35 μΩ*cm
Thermal Conductivity	Laser Flash Diffusivity	45 W/mK
Weight Loss on Sintering	TGA	<5%
Work Life	Application testing after RT storage	24 hours @ 25°C
Estimated Storage Life		12 months < -10°C

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TYPICAL APPLICATIONS

Ormet 400 is intended for applications in which assembled parts will undergo additional assembly operations, other high temperature processing subsequent to assembly, or will be used in harsh, high-temperature environments. **Ormet 400** is not reworkable; however, it is solderable if processed in an inert environment. **Ormet 400** will metallurgically alloy to solderable surfaces to provide high interfacial and bulk thermal conductivity. The metal matrix within the sintered **Ormet 400** exhibits no significant remelt below 400 °C and will maintain the deposition footprint and shape throughout reflow processing.

MATERIAL DEPOSITION GUIDELINES

Ormet 400 can be applied by a range of techniques. Most frequently **Ormet 400** is applied by stenciling or screen-printing. Ormet 402, a modified, lower viscosity, version of **Ormet 400** is available for dispensing and Ormet 406 provides a smaller particle size for fine pitch applications. In general, the **Ormet 400** series pastes should be handled and processed in the same manner as lead-free no-clean solder pastes

DRYING AND SINTERING PROCESS GUIDELINES

	Recommended Profile
Sintering/Curing*	**Standard lead-free SMT reflow:** **240-260°C peak temperature with a typical** **140-165°C solvent evolution/flux activation soak.**

***A nitrogen environment is mandatory for the sintering process.**

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STORAGE AND HANDLING

Ormet 400 is supplied in 10cc syringes as well as a range of jar and cartridge sizes, and must be stored at -5°C MAX. **Ormet 400** must be stabilized to room temperature for 30 minutes before opening the jars or syringes for use.

GENERAL INFORMATION

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

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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.

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