CuantumFuse™ Stencil Printing/Dispense Paste

Technical Data Sheet

Kuprion

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Product Description

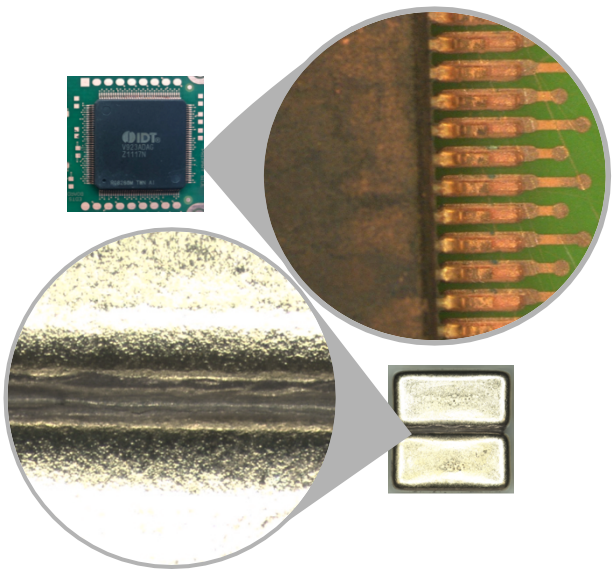
Kuprion's CuantumFuse™ Stencil Printing/Dispense paste is a flowable copper 'metal-adhesive' that provides users with superior thermal and electrical performance. It is an excellent alternative for lead- and lead-free solders, AuSn and nanosilver for general surface-mount applications (SMT). It undergoes pressureless sintering (fusion) at 195°C to 240°C to form bulk copper.

Product Benefits

- Thermal Conductivity: 240 - 280 W m^{-1} K^{-1}
- Electrical Conductivity: 35 – 70% of bulk copper
- Compatibility:Cu, Ag, Au, ENEPIG, OSP, Sn, SAC
- No-clean material system
- Lead-free and RoHS compliant
- Ready for immediate use

Application Specifications

- Application Method: **Stencil Printing ; Dispense**
- Compatible with industry standard die bonding equipment
- Preferred application temperature: 18 - 25°C



Top: Amkor QFP bonded to OSP-coated copper pads
Bottom: Tin cap component bonding

Properties After Fusion

Property	Unit	Value
Material		Fused State
Color		Pink
Nanoporosity	%	4 – 12
Shear Strength	kg/mm^2	4.5 – 8.5
Thermal Conductivity	W m^{-1} K^{-1}	240 – 280
Electrical Conductivity	% IACS	35% – 70%
Linear Coefficient of Thermal Expansion	ppm K^{-1}	23
Bond Line Thickness	µm	2 – 50
Melting Point	°C	1084
Modulus of Elasticity	GPa	11 – 16

Paste Properties

Property	Units	Value
Material		nanocopper
Color		Brown
Particle Size	nm	<100
Density	g cm^{-3}	3.7 – 4.2
Shelf Life (r.t. storage)	months	7

The above tables show the measured properties for CuantumFuse™ Stencil Printing/Dispense paste based on specific controlled experiments in our lab. These values can be achieved by following the recommended processing conditions.

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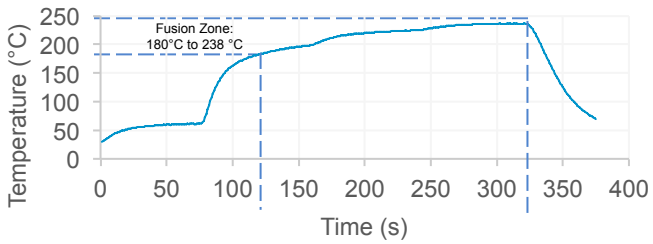
Thermal Process

Recommended Reflow Profile



This profile is simply a guideline as CuantumFuse™ Stencil Printing/Dispense paste is a highly active nanomaterial which fuses effectively over a wide range of profiles. Your optimal profile may differ from the one shown based on your equipment, substrate and component type and size. Please contact Kuprion Technical Support for additional profiling advice.

Profile Guidelines

- The initial ramp rate between 60 °C to 160°C is 3 °C/s to 4°C/s.
- The assembly is then soaked at the peak temperature between 195°C to 240 °C for up to 5 min.
- The cooling down process is controlled within 4°C/s.
- The total profile length from ambient to peak temperature is between 5 min to 8 min.

General Process Conditions

- **Suitable Process Oven**: Conduction/Convection Oven
- **Process Conditions:** Inert Gas (Nitrogen or Argon)
- **Oxygen Concentration:** Below 65 ppm
- **Process Set-Up:** Use with conductive carrier and cover.

Storage and Shelf Life

- The material is best stored at room temperature (18 – 25 °C) in a sealed bag.
- Unused paste should be kept tightly sealed with the internal plug or end cap.
- Used paste should not be added to unused paste.
- Under proper storage conditions, the shelf life of the material is generally 7 months from the date of manufacture. The shelf life is dependent on the environment and application.
- Contact Kuprion Technical Support for additional information regarding storage and handling.

Handling Recommendations

- The paste can be used directly without further preparation.
- The paste can be cleaned up using isopropanol and standard cleaning equipment within 8 hours of dispensing.

Health and Safety

This product, during handling or use, may be hazardous to your health or the environment. Read the Safety Data Sheet before using this product.

Ordering information

	Sizes (Order #)		
Description	25 g	100 g	500 g
Stencil Printing/ Dispense paste	ST13521801-002	ST13521801-01	ST13521801-05

For pricing and bulk orders, call Kuprion.