

ZTERIAL 517

Technical Data Sheet For Reference Only

ZTERIAL 517 is an electrically conductive die attach adhesive designed for microelectronic chip bonding applications. It is well-suited for various application methods, including dispensing, stamping, screen printing, and hand probing. Due to its high thermal conductivity, it is also widely used in thermal management applications. The adhesive's optimized rheology enables minimal adhesive dispense and die put down dwell times, without issues such as tailing or stringing. Its unique combination of electrical and thermal properties makes it one of the most commonly used die attach adhesives in the semiconductor industry.

TYPICAL PROPERTIES OF UNCURED ADHESIVE

Technology	Epoxy
Appearance	Silver
Application	Die attach
Filler Type	Silver
Number of Components	Two
Mixture of Ratio	1:1
Viscosity @25°C, cPs, Speed 10 rpm	30000
Thixotropic Index	4
Work Life @ 25°C, days	3
Storage Life @-40°C, days	365
Storage Life @ room temperature, days	365

TYPICAL CURING PERFORMANCE

Cure Schedule	1 hour @150°C
Minimum Alternate Cure	5 minutes @150°C 15 minutes @120°C 180 minutes @80°C



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TYPICAL PROPERTIES OF CURED ADHESIVE

Glass Transition Temperature (Tg), °C	> 100
Degradation Temperature, °C	450
Weight Loss @ 200°C, %	0.2
@ 300°C, %	0.3
Coefficient of Thermal Expansion	
Below Tg, ppm/°C	20
Above Tg, ppm/°C	120
Extractable Ionic Content, ppm:	
Chloride (Cl-)	<15
Sodium (Na+)	<5
Potassium (K+)	<5
Die Shear Strength :	
2 x 2 mm Si die	
on Ag/Cu LF @ 25 °C, Kg	>10
Lap Shear Strength @ 25°C, psi	>1500
Electrical Properties	
Volume Resistivity, ohms-cm	<0.00006
Thermal Conductivity, W/(m-K)	3.0

SUGGESTED APPLICATIONS

Semiconductor IC Packaging

- Designed for die attachment to leadframes; compatible with both silicon (Si) and MEMS chips. It supports 260°C lead-free reflow processes and meets JEDEC Level I packaging standards.
- The material can be snap cured in-line or using traditional box oven methods, offering flexible processing options.
- It is also ideal for solderless flip chip packaging and ultra-fine pitch SMD printing applications.

Hybrid Microelectronics

- An alternative to solder and eutectic die attach, offering comparable thermal conductivity.
- Ideal for die attachment of quartz crystal oscillators (QCOs) to gold (Au) posts in TO-can style lead frames.

- Commonly used with GaAs chips in microwave and radar applications up to 77 GHz.
- SMD Attach Adhesive to cure simultaneously with die-attach processes. It is fully compatible with Au, Ag, and Ag-Pd terminations commonly used in capacitors and resistor SMDs.
- EMI and RF Shielding Adhesive for effective EMI and RF shielding of RF, microwave, and IR devices, ensuring optimal signal integrity and device protection.

Electronic & PCB Circuit Assembly

- Used for reliable electrical contacts in a range of electronic and acoustical applications, including speaker and microphone assemblies.
- Secure connections between piezoelectric elements (PZTs) and printed circuit boards (PCBs), supporting applications such as inkjet print heads, MEMS devices, and ultrasound equipment.
- In the automotive sector, employed in pressure sensors and accelerometer circuits.
- Facilitate the bonding of copper coils in RF antenna assemblies for smart cards and RFID tags.
- Used to attach surface-mount devices (SMDs) to membrane switch flex circuits. Compatible with Ag-PTF and carbon graphite PCB pads, offering a low-temperature, solder-free alternative.
- Solar-Photovoltaic Industry Applications
 - Used for connecting transparent conductive oxide (TCO) layers to PCB pads.
 - Replacement for traditional Cu/Sn ribbon solder joints in cell-to-cell interconnections.
 - Die-attach solution for III-V semiconductor chips on substrates used in solar concentrator technologies, including CdTe and GaAs.
 - Effective heat-sink on thermal substrates such as copper (Cu), beryllium oxide (BeO), and aluminum nitride (AlN).
 - Capable of high-volume dispensing in the form of dots, arrays, or continuous writing patterns.

Opto-Electronic Packaging Applications

- Adhesive solutions for fiber optic components in DIP, butterfly, and custom hybrid IC packages, for attaching waveguides, die-bonding laser diodes, and heat-sinking high-power laser circuits.
- Die-attach adhesive for IR detector chips onto PCBs or TO-can style headers.
- Die-attach adhesive for LED chips on substrates using single-chip or chip-array packages, with reliable adhesion to Ag, Au, and Cu-plated leadframes and PCBs.
- Electrical connection of ITO to PCBs in LCD manufacturing. A low-temperature adhesive for OLED displays and printable organic electronics.

GENERAL INFORMATION

Thawing Instructions

1. Allow container to reach room temperature before use.
2. Do not open the container until the contents have fully reached ambient temperature. Remove any moisture that has formed on the thawed container prior to opening.

Storage

Store the product in its unopened container in a dry environment. Optimal storage temperature: -40 °C.

Application Notes

1. Dispensing: Compatible with pressure/time systems, auger screws, fluid jetting, and G27 needles for single-component dispensing.
2. Screen Printing: Optimized for use with metal mesh screens >200 mesh, and polymer squeegee blades rated at 80D hardness.
3. Stamping: Capable of producing small dots as small as 6 mil in diameter.
4. Curing Methods: Supports various curing techniques including box ovens, SMT-style tunnel ovens, heat guns, hot plates, IR, convection, and induction coils.
5. Customization: Product modifications available to enhance viscosity, appearance, flexibility, and thermal conductivity.

Disclaimer Notes:

The Technical Data Sheet provided herein is intended for reference only. The information and recommendations regarding the use and application of this product are based on our knowledge and experience. Due to the wide range of potential applications and varying processing conditions beyond our control, ZTERIAL makes no guarantees regarding the product's suitability for your specific manufacturing processes, conditions, or intended results. We strongly recommend that you carry out your own independent tests to verify the product's suitability for your particular use. It is the user's sole responsibility to assess whether any production methods or practices mentioned are appropriate for their purposes and to take all necessary precautions to ensure the safety of personnel and property when handling and using the product.