

Number of Components:	Two	Minimum Bond Line Cure Schedule*:	
Mix Ratio By Weight:	3:1	120°C	1 Hour
Specific Gravity:		80°C	3 Hours
Part A	3.26	45°C	6 Hours
Part B	3.97		
Pot Life:	2-3 Hours		
Shelf Life:	One year at room temperature		

Note: Container(s) should be kept closed when not in use. For filled systems, mix contents of each container (A & B) thoroughly before mixing the two together. \*Please see Applications Note available on our website.

### Product Description:

EPO-TEK<sup>®</sup> E4110-PFC is a two-component, silver filled, electrically conductive adhesive designed for semiconductor IC packaging and general electronic assembly. It is a thixotropic version of EPO-TEK<sup>®</sup> E4110, suggested for applications requiring a screen printing process as well as jetting.

### EPO-TEK<sup>®</sup> E4110-PFC Advantages & Application Notes:

- A thixotropic paste which enables ultra-fine pitch applications at the wafer or PCB/substrate packaging level. It may be dispensed, printed or jetted.
- Semiconductor Flip Chip Suggested Applications:
  - Flip Chip attaching of IC's direct to substrate or in semiconductor advanced plastic packages.
  - "Dots" of E4110-PFC may be realized at 75µm diameter and 125µm pitch.
  - Compatible with screen printing processes, whether mesh or stencil foils. The former requires > 200 mesh wires while the latter should be laser etched SST foil.
  - Capable of curing at temperatures as low as 45°C for solder replacement.
- Medical Suggested Applications
  - Electrically conductive bridge when bonding Au-plated piezo-ceramic arrays to PCBs, used in ultrasonic devices.
  - Flip chip attachment of photo-detector arrays found in X-ray and CT detectors
- Opto-electronics Suggested Applications
  - Electrically conductive adhesive found in sensor and fiber optic devices
  - Electrical bridge of ITO contact pads to PCBs found in LCD/Displays and OLED's
- Flex Circuits suggested Applications.
  - Solar / Photo-voltaic. Adhesive for electrically back-contacting, thin film, organic and dye sensitized solar cells.
  - Flip Chip adhesive dots bridging RFID chips to antennae, or smart card IC packaging.
  - Electrical bridge of Au/PZT arrays to Au/Kapton found on ink-jetting circuits

**Typical Properties:** (To be used as a guide only, not as a specification. Data below is not guaranteed. Different batches, conditions and applications yield differing results; Cure condition: 80°C/3 hours ; \* denotes test on lot acceptance basis)

Physical Properties:	
*Color: Part A: Silver Part B: Silver	Weight Loss:
*Consistency: Smooth thixotropic paste	@ 200°C: 0.37%
*Viscosity (@ 5 RPM/23°C): 50,000 – 60,000 cPs	@ 250°C: 0.88%
Thixotropic Index: 3.3	@ 300°C: 1.38%
*Glass Transition Temp.(Tg): ≥ 40°C (Dynamic Cure 20—200°C /ISO 25 Min; Ramp -40—200°C @ 20°C/Min)	Operating Temp:
Coefficient of Thermal Expansion (CTE):	Continuous: - 55°C to 150°C
Below Tg: 48 x 10 <sup>-6</sup> in/in/°C	Intermittent: - 55°C to 250°C
Above Tg: 207 x 10 <sup>-6</sup> in/in/°C	Storage Modulus @ 23°C: 221,719 psi
Shore D Hardness: 68	Ions: Cl <sup>-</sup> 32 ppm
Lap Shear Strength @ 23°C: 1,250 psi	Na <sup>+</sup> 13 ppm
Die Shear Strength @ 23°C: ≥ 5 Kg /1,700 psi	NH <sub>4</sub> <sup>+</sup> 20 ppm
Degradation Temp. (TGA): 337°C	K <sup>+</sup> 2 ppm
	*Particle Size: ≤ 20 Microns
Electrical Properties:	
*Volume Resistivity @ 23°C: ≤ 0.005 Ohm-cm	
Thermal Properties:	
Thermal Conductivity: 1.56 W/mK	

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