EPOXY TECHNOLOGY

EPO-TEK® E4110-PFC

Technical Data Sheet
For Reference Only
Electrically Conductive Epoxy

Date:	April 2018	
Rev:	X	
No. of Components:	Two	
Mix Ratio by Weight:	3 : 1	
Specific Gravity:	Part A: 3.26	Part B: 3.97
Pot Life:	2 - 3 Hours	
Shelf Life- Bulk:	One year at room temperature	

Recommended Cure: 80°C / 3 Hours

Minimum Alternative Cure(s):
May not achieve performance properties listed below
120°C / 1 Hour
45°C / 6 Hours

NOTES:
- Container(s) should be kept closed when not in use.
- Filled systems should be stirred thoroughly before mixing and prior to use.
- Performance properties (rheology, conductivity, others) of the product may vary from those stated on the data sheet when bi-pak/syringe packaging or post-processing of any kind is performed. Epoxy's warranties shall not apply to any products that have been reprocessed or repackaged from Epoxy's delivered status/container into any other containers of any kind, including but not limited to syringes, bi-paks, cartridges, pouches, tubes, capsules, films or other packages.
- Syringe packaging will impact initial viscosity and effective pot life, potentially beyond stated parameters.

Product Description: EPO-TEK® 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® E4110, suggested for applications requiring a screen printing process as well as jetting.

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

PHYSICAL PROPERTIES:				
* Color (before cure):	Part A: Silver		Part B: Silver	
* Consistency:	Smooth thixotropic paste			
* Viscosity (23°C) @ 5 rpm:		50,000-60,000	cPs	
Thixotropic Index:		3.3		
* Glass Transition Temp:		≥ 40	°C (Dynamic Cure: 20-200°C/ISO 25 Min; Ramp -40-200°C @20°C/Min)	
Coefficient of Thermal Expansion (CTE):				
Below Tg:		48	$x 10^{-6}$ in/in°C	
Above Tg:		207	$x 10^{-6}$ in/in°C	
Shore D Hardness:		68		
Lap Shear @ 23°C:		1,250	psi	
Die Shear @ 23°C:		≥ 5	Kg	1,778 psi
Degradation Temp:		337	°C	
Weight Loss:				
@ 200°C:		0.37	%	
@ 250°C:		0.88	%	
@ 300°C:		1.38	%	
Suggested Operating Temperature:		< 250	°C (Intermittent)	
Storage Modulus:		221,719	psi	
Ion Content:	Cl^-:	32 ppm	Na^+:	13 ppm
	NH_4^+:	20 ppm	K^+:	2 ppm
* Particle Size:		≤ 20	microns	

ELECTRICAL AND THERMAL PROPERTIES:		
Thermal Conductivity:	1.6	W/mK
* Volume Resistivity @ 23°C:	≤ 0.005	Ohm-cm

This information is based on data and tests believed to be accurate. Epoxy Technology, Inc. makes no warranties (expressed or implied) as to its accuracy and assumes no liability in connection with any use of this product.

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EPO-TEK® E4110-PFC Advantages & Suggested 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
- 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.

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