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TECHNICAL DATA SHEET

PTC Heater Ink Series

Carbon Filled Self Regulating Screen Printable Heater Inks

PTC Heater Ink Series features several unique **positive thermal coefficient** inks designed for **printing heater circuits onto flexible substrates.**

DESCRIPTION

PTC Inks can be used to make heaters that can be powered with low DC voltage

- When powered, a printed PTC ink circuit will warm to a temperature between 60°C and 70°C and remain there without requiring a thermocouple feedback to adjust voltage to maintain temperature
- The PTC ink series is designed for use with flexible substrates that will be bent and has outstanding adhesion to most substrates. PTC ink series also has excellent abrasion and scuff resistance.
- All PTC inks are designed to give a good balance between long open time during screen printing operations, short drying time in subsequent drying applications and are compatible with our silver inks used for printing heater busbars and UV dielectrics for topcoats.

The key to building a successful circuit is dependent on the overall circuit design, including trace layout, trace length and print thickness. When using pressure sensitive overlay films on heaters, contact Conductive Compounds, Inc. to assure that the pressure sensitive adhesive is compatible with the PTC Ink Series.

TYPICAL PROPERTIES

Appearance	Thixotropic black colored paste
Drying Schedule	<5 minutes at 145°C (depending upon heat source and air flow)
Shelf Life	6 months in unopened container
Hegman Gage	<50.0 µ

INDIVIDUAL PROPERTIES

	PTC-614	PTC-921	PTC-922
Total % NV Solids	35% +/- 2%	38% +/- 2%	38% +/- 2%
Surface Resistivity At room temp.	<10K Ω/ Square	10<K Ω/Square	10<K Ω/Square

Guidelines are intended to provide a starting point for evaluation. Conductive Compounds, Inc. recognizes that each customer's manufacturing process is unique, and we are available to provide technical assistance to resolve your processing issues. Call us to discuss your application in more detail.

The properties are accurate to the best of our knowledge and Conductive Compounds, Inc. makes no guarantees for customer specifications established in applications where this product is used. Customer assumes responsibility for determining fitness of use in their particular application.

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PTC RESISTANCE - Kohms/sq/mil (25°C vs. 85°C)			
	PTC -614	**PTC-921**	**PTC-922**
25°C	1	5	100
85°C	35 MΩ	1MΩ	3MΩ
25/85 PTC Ratio	*3.5*	200	30

Application Guidelines

- Always mix ink thoroughly before using because carbon can settle over time.

Screening

- A monofilament polyester (157 to 230 mesh) or stainless steel (165 to 325 mesh) screen is recommended with emulsion thickness between .001" and .004". A polyurethane squeegee with a Shore 'A' durometer between 60 and 70 is recommended.

Thinning & Cleanup

- Use dibasic esters. PTC inks are thick pastes designed to thin out once mixed or put on press for several cycles. If thinning is needed, add very small amounts of solvent. If solvent based inks are left on screens for any length of time, the ink will gradually thicken as solvent evaporates. If ink is to be left on an inactive press for any length of time, solvent evaporation can be minimized by pooling the ink into a small area instead of leaving it spread out over a large area. Pooling the ink reduces the surface area, thus slowing the drying process. Always check the viscosity of ink that has been recovered from a screen and add small amounts of solvent while mixing thoroughly to restore viscosity. Solvent can be added to reclaim thickened ink as long as the ink has not dried and hardened completely.

Drying

- It is essential that all residual solvent be removed from this ink once it is applied. Incomplete drying will cause the ink to appear dry on the surface while trapping solvent underneath the surface. Over time, this trapped solvent will migrate out of the ink, and can cause adhesion problems with any material (such as dielectrics) applied over the ink.

Completeness of Drying

- Evaluate the point-to-point resistance along one of the screened conductive paths after one pass through the drying oven or one cycle in a batch-drying-oven. Run the substrate through another drying cycle. Measure the point-to-point resistance again along the same path and compare it to the original reading. If the resistance decreases by less than 10%, then the ink is essentially dry after the first drying cycle or pass through the oven. If the resistance decreases by more than 10%, then more drying time is required to completely remove the solvent.

Health & Safety

- Products manufactured by Conductive Compounds., Inc. are intended for use in an industrial environment by trained personnel. Please follow proper health/safety processes regarding storage, handling and processing of the products.

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