ELPEPCB®
peters

TR TECHNICAL REPORT

Heatsink paste HSP 4 A

The heatsink paste **HSP 4 A** is a highly thermally conductive system simplifying the thermal management of pcbs/pcb assemblies.

- Base: Epoxy resin
- high-definition application by means of screen or stencil printing
- can be applied in variable structures and layer thicknesses
- cost-effective alternative to conventional glued heatsinks
- excellent adhesion to solder resists and various metallic substrates
- high mechanical resistance
- very good solder resistance
- good resistance in immersion tin
- UL Recognised Component in accordance with UL 94 (UL file no. E80315)
- smooth surface enables good thermal connection in combination with **TIP 2792**

Characteristics

The characteristics are indicated in the product-specific process data sheets which are enclosed with the first shipment of the product/sample, or transmitted upon request.

Physical and mechanical properties

Property	Test method	Result
Pencil hardness	acc. to Wolff-Wilborn	7 H
Solvent resistance	IPC-TM-650, 2.3.42 Isopropanol Isopropanol (75 %) / H_2O (25 %) monoethanolamine deionized H2O	 passed passed passed passed
Water absorption	DIN EN ISO 62 (24 h/23 °C [73.4°F]	≈ 0.04 %
Solder bath resistance	IPC-SM-840E, 3.7.1/3.7.2 IPC-TM-650, 2.6.8	20 s at 265 °C [509 °F] 10 s at 288 °C [550,4 °F]
Glass transition temperature Tg	TMA, Tension Mode	≈ 107 °C [≈ 224,6 °F]
Coefficient of thermal expansion CTE	TMA, expansion mode	≈ 22 ppm/°C < Tg ≈ 97 ppm/°C > Tg
Heat conductivity	Laser flash method DIN EN 821 / ASTM E1461	≥ 1.3 W/mK

Electrical properties

Property	Test method	HSP 4 A
Dielectric strength	IPC-TM-650, 2.5.6.1	≥ 27 kV/mm
Surface resistance	DIN EN 62631-3-2	≥ 3.3 x 10^{13} Ohm
Specific volume resistivity	DIN EN 62631-3-1	≥ 6.7 x 10^{13} Ohm x cm
Comparative Tracking Index (CTI)	DIN EN 60112 on FR 4 base material with CTI 200	CTI ≥ 600*

* Among others, the CTI value of the coating also depends upon the tracking resistance of the base material. The CTI value of the base material is at least maintained.

Processing

	Please read this technical report and the publications listed below carefully before using the product. These sheets are enclosed with the first shipment of product or sample.
MSDS	The corresponding material safety data sheet contains detailed information and characteristics on safety precautions, environmental protection, transport, storage, handling and waste disposal.
PD	The process data sheet contains product-specific data such as characteristics and recommendations for processing parameters.
TI	Technical information TI 15/3 “Protective measures when using chemicals including lacquers, casting compounds, thinners, cleaning agents“
TI	Technical information TI 15/13 “Precleaning in the pcb fabrication process“

Advice on pcb design: On account of the relatively high layer thickness of the heatsink paste, one should avoid printing solder paste directly next to the heatsink area in order to ensure a perfect solder paste print.

The heatsink paste HSP 4 A is not suitable for printing on Pb/Sn surfaces which melt during soldering and cause the heatsink pastes to lift.

Given the relatively high layer thickness and the volume shrinkage related thereto, warpings may occur when thin substrates < 1 mm are coated.

Due to the large variety of chemical finish processes available and the fact that some of them are extremely aggressive, one must verify the compatibility by carrying out appropriate pre-trials.

Depending on the substrate printed, more or less intense bleeding may occur with the heatsink paste HSP 4 A. For this reason, we recommend that you check the bleeding behaviour in your specific application.

Since the many different permutations make it impossible to evaluate the whole spectrum (parameters, reactions with materials used, chemical processes and machines) of processes and subsequent processes in all their variations, the parameters we recommend are to be viewed as guidelines only that were determined in laboratory conditions. We advise you to determine the exact process limitations within your production environment, in particular as regards compatibility with your specific follow-up processes, in order to ensure a stable fabrication process and products of the highest possible quality.

The specified product data is based upon standard processing conditions/test conditions of the mentioned norms and must be verified if necessary while observing suitable test conditions on processed products.

Feel free to contact our application technology department (ATD) if you have any questions or for a consultation.

Auxiliary products recommended

- ELPESPEC® Cleaning agent R 5899
  for screen washing equipment, simply and safely to handle, no labelling in accordance with the German dangerous goods regulations required, extremely high flash point (> 100 °C [> 212 °F]), low vapour pressure < 0.1 hPa at 20 °C [68 °F], thus not affected by the EU-VOC regulation 1999/13/CE
- ELPESPEC® Cleaning agent R 5821
  for the cleaning of equipment and work tools, high flash point (+32 °C [89.6 °F])
- ELPESPEC® Cleaning agent R 5817
  for the manual cleaning of screens and tools

Packaging

The packing units available are indicated in our offer which we will send you upon request.

Disclaimer

All descriptions and images of our goods and products contained in our technical literature, catalogues, flyers, circular letters, advertisements, price lists, websites, data sheets and brochures, and in particular the information given in this literature are non-binding unless expressly stated otherwise in the Agreement. This shall also include the property rights of third parties if applicable.

The products are exclusively intended for the applications indicated in the corresponding technical data sheets. The advisory service does not exempt you from performing your own assessments, in particular as regards their suitability for the applications intended. The application, use and processing of our products and of the products manufactured by you based on the advice given by our Application Technology Department are beyond our control and thus entirely your responsibility. The sale of our products is effected in accordance with our current terms of sale and delivery.

Any questions? We would be pleased to offer you advice and assistance in solving your problems. Samples and technical literature are available upon request.

Lackwerke Peters GmbH & Co. KG
Hooghe Weg 13, 47906 Kempen, Germany
Internet: www.peters.de
E-Mail: peters@peters.de
Phone +49 2152 2009-0
Fax +49 2152 2009-70

peters
Coating Innovations for Electronics