

EPO-TEK[®] H31D **Technical Data Sheet For Reference Only** Electrically Conductive, Silver Epoxy

Date: April 2023 Rev: IX No. of Components: Single Mix Ratio by Weight: N/A **Specific Gravity:** 2.85 Pot Life: 3 Months (closed container) Shelf Life- Bulk: Six months at -40°C

Recommended Cure: 150°C / 1 Hour

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.

• Failure to ship frozen may result in viscosity growth beyond the range of values herein; customer assumes all risk.

Product Description: EPO-TEK® H31D is a single component, electrically conductive silver epoxy designed for die-bonding of semiconductors, including IC's, resistors, capacitors, transistors, and diodes which may be found in opto-electronics packaging or hybrid micro-electronics.

Typical Properties: Cure condition: 150°C / 1 Hour 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): | Silve | er | |
| * Consistency: | Smo | oth thixotrop | pic paste |
| * Viscosity (23°C) @ 5 rpm: | 40,0 | 000-70,000 | cPs |
| Thixotropic Index: | | 4.5 | |
| * Glass Transition Temp: | | ≥ 110 | °C (Dynamic Cure: 20-200°C/ISO 25 Min; Ramp -10-250°C @20°C/Min) |
| Coefficient of Thermal Expansion (CTE): | | | |
| Below Tg | | 42 | x 10 ⁻⁶ in/in°C |
| Above Tg | : | 178 | x 10 ⁻⁶ in/in°C |
| Shore D Hardness: | | 85 | |
| Lap Shear @ 23°C: | | 1,152 | psi |
| Die Shear @ 23°C: | | ≥ 5 | Kg 1,778 psi |
| Degradation Temp: | | 350 | °C |
| Weight Loss: | | | |
| @ 200°C | : | 0.08 | % |
| @ 250°C | : | 0.18 | % |
| @ 300°C | : | 0.43 | % |
| Suggested Operating Temperature: | | < 300 | °C (Intermittent) |
| Storage Modulus: | | 905,956 | psi |
| Ion Content: | Cl-: | 19 ppm | Na ⁺ : 222 ppm |
| | | | K ⁺ : 36 ppm |
| * Particle Size: | | ≤ 20 | microns |
| ELECTRICAL AND THERMAL PROPERTIES: | | | |
| Thermal Conductivity: | | 3.5 | W/mK |
| * Volume Resistivity @ 23°C: | | ≤ 0.0005 | Ohm-cm |
| Dielectric Constant (1KHz): | | N/A | |

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N/A

A Meridian Adhesives Group Company

Dissipation Factor (1KHz):

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EPO-TEK® H31D Advantages & Suggested Application Notes:

- Rheology provides a soft, smooth, thixotropic paste. The epoxy can be screen printed or applied by hand or spatula.
- Ideal for screen printing applications. Designed for use in machine dispensing where dot sizes as small as 8 mils can be readily deposited.
- Available in lower viscosity versions; contact <u>techserv@epotek.com</u> for your best recommendation.
- Thermal resistance is nearly equivalent to solder die-attach. Suitable for laser diode attach, TE Coolers, and heat-sinking in general.
- Reliability report summarized in Technical Paper #2 from Epoxy Technology -<u>http://www.epotek.com/technical-papers.asp</u>.