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ABOUT OUR COMPANY

Dr. Dietrich Müller GmbH is a global solution provider for electrical insulation materials, thermally conductive products, seals and technical films.

We advise on the selection of the right material and manufacture precision parts from flexible and rigid materials. We operate 6 sites and provide services to companies around the world.

We are ISO 9001 and ISO 14001 certified and UL listed as a repackager (E341377).

The following datasheet is not subject to the Modification Service.

Description

834HTC *potting and encapsulating compound* is a black, flame retardant, thermally conductive two-part epoxy that offers extreme environmental, mechanical and physical protection for printed circuit boards and electronic assemblies.

834HTC is designed for applications where thermal management and self-extinguishing are critical. It also provides excellent electrical insulation and protects components from static discharges, vibration, abrasion, thermal shock, environmental humidity, salt water, fungus, and many harsh chemicals.

834HTC can be cured at room temperature or higher.

Benefits and Features

- **Meets UL 94V-0 standard—flame retardant**
- **Thermal conductivity of 0.94 W/(m·K)**
- **Low CTE**
- **Low exotherm**
- **High compressive and tensile strength**
- **Excellent adhesion to a wide variety of substrates including metals, composites, glass, ceramics, and many plastics**
- **Excellent electrical insulating characteristics**
- **Broad service temperature range -50 to 150 °C (-58 to 302 °F)**
- **Low shrinkage and high dimensional stability**
- **5A:1B volume mix ratio**
- **Contains non-halogenated flame-retardant fillers**
- **Solvent-free**

Usage Parameters

Properties	Value
Working Time @22 °C [72 °F] ^{a)}	1.5 h
Shelf Life	1 y
Full Cure @22 °C [72 °F]	24 h
Full Cure @65 °C [149 °F]	2 h
Full Cure @80 °C [176 °F]	1 h
Full Cure @100 °C [212 °F]	30 min

a) Working time and full cure assumes room temperature and 100 g. A 10 °C increase can decrease the working time by half.

Temperature Ranges

Properties	Value
Constant Service Temperature	-50 to 150 °C [-58 to 302 °F]
Intermittent Temperature Limit ^{b)}	-55 to 165 °C [-67 to 329 °F]
Storage Temperature of Unmixed Parts	16 to 27 °C [61 to 81 °F]

b) Temperature range that components can withstand for short periods without sustaining damage.

Properties of Cured 834HTC

<i>Physical Properties</i>	<i>Method</i>	<i>Value</i> ^{a)}
Color	Visual	Black
Density @25 °C [77 °F]	ASTM D 1475	1.69 g/mL
Hardness	Shore D Durometer	91D
Tensile Strength	ASTM D 638	22 N/mm ² [3 200 lb/in ²]
Compressive Strength	ASTM D 695	123 N/mm ² [17 800 lb/in ²]
Lap Shear Strength (Stainless Steel)	ASTM D 1002	6.7 N/mm ² [970 lb/in ²]
Lap Shear Strength (Aluminum)	ASTM D 1002	4.7 N/mm ² [690 lb/in ²]
Lap Shear Strength (Copper)	ASTM D 1002	8.4 N/mm ² [1 200 lb/in ²]
Lap Shear Strength (Brass)	ASTM D 1002	5.0 N/mm ² [720 lb/in ²]
Lap Shear Strength (Polycarbonate)	ASTM D 1002	1.2 N/mm ² [170 lb/in ²]
Lap Shear Strength (ABS)	ASTM D 1002	1.9 N/mm ² [280 lb/in ²]
Flammability	UL 94	Meets 94 V-0
<i>Electrical Properties</i>	<i>Method</i>	<i>Value</i>
Breakdown Voltage @2.4 mm	ASTM D 149	37 500 V 37.5 kV
Dielectric Strength @2.4 mm	ASTM D 149	395 V/mil 15.5 kV/mm
Breakdown Voltage @3.175 mm [1/8"]	Reference fit ^{b)}	43 100 V 43.1 kV
Dielectric Strength @3.175 mm [1/8"]	Reference fit ^{b)}	345 V/mil 13.6 kV/mm
Volume Resistivity	ASTM D 257	3.0 x 10 ¹³ Ω·cm
Volume Conductivity	ASTM D 257	3.6 x 10 ⁻¹⁴ S/cm
Dielectric Dissipation, D @1 MHz	ASTM D 150-11	0.019
Dielectric Constant, k' @1 MHz	ASTM D 150-11	3.91
<i>Thermal Properties</i>	<i>Method</i>	<i>Value</i>
Glass Transition Temperature (T _g) ^{c)}	ASTM D 3418	117 °C [243 °F]
CTE ^{d)} prior T _g	ASTM E 831	34 ppm/°C
after T _g	ASTM E 831	116 ppm/°C
Thermal Conductivity @25 °C [77 °F]	ASTM E 1461 92	0.94 W/(m·K)
@50 °C [122 °F]	ASTM E 1461 92	0.99 W/(m·K)
@100 °C [212 °F]	ASTM E 1461 92	0.89 W/(m·K)
Thermal Diffusivity @25 °C [77 °F]	ASTM E 1461 92	0.42 mm ² /s
Specific Heat Capacity @25 °C [77 °F]	ASTM E 1269 01	1.3 J/(g·K)

Note: Specifications are for epoxy samples cured at 65 °C for 2 hours, with additional curing time at room temperature for optimal results. For most tests, samples were conditioned at 23 °C and 50% RH.

a) N/mm² = mPa; lb/in² = psi

b) To allow comparison between products, the Tautscher equation was fitted to 4 experimental dielectric strengths and extrapolated to a standard reference thickness of 1/8" (3.175 mm).

c) Samples cured at 100 °C for 4 hours.

d) Coefficient of Thermal Expansion (CTE) units are in ppm/°C = in/in/°C × 10⁻⁶ = unit/unit/°C × 10⁻⁶

Properties of Uncured 834HTC

<i>Physical Properties</i>	<i>Mixture</i>	
Color	Black	
Viscosity @25 °C [77 °F]	10 500 cP [10.5 Pa·s] ^{a)}	
Density	1.70 g/mL	
Mix Ratio by volume (A:B)	5:1	
Mix Ratio by weight (A:B)	10:1	
<i>Physical Properties</i>	<i>Part A</i>	<i>Part B</i>
Color	Black	Clear
Viscosity @25 °C [77 °F]	55 900 cP [55.9 Pa·s] ^{b)}	24 cP [0.024 Pa·s] ^{c)}
Density	1.86 g/mL	0.94 g/mL
Odor	Mild	Mild

a) Brookfield viscometer at 50 RPM with spindle RV S64

b) Brookfield viscometer at 12 RPM with spindle RV S63

c) Brookfield viscometer at 100 RPM with spindle RV S61

Compatibility

Adhesion—As seen in the substrate adhesion table, 834HTC epoxy adheres to most plastics and metals used to house printed circuit assemblies; however, it is not compatible with contaminants like water, oil, or greasy flux residues, which may affect adhesion. In case of contamination, first clean the surface to be coated with MG Chemicals 824 Isopropyl Alcohol.

Substrate Adhesion in Decreasing Order

<i>Physical Properties</i>	<i>Adhesion</i>
Copper	Stronger
Steel	
Brass	
Aluminum	
Fiberglass	
Wood	
Paper, Fiber	
Glass	
Rubber	
Acrylic	
Polycarbonate	
Polypropylene ^{a)}	
Teflon ^{a)}	Weaker

a) Does not bond to polypropylene or Teflon



834HTC Technical Data Sheet

Flame Retardant Epoxy Encapsulating & Potting Compound

ISO 9001:2008 Registered Quality System. Burlington, Ontario, CANADA SAI Global File: 004008

834HTC

Storage

Store between 16 and 27 °C [60 and 80 °F] in a dry area away, from sunlight. Prolonged storage, or storage at or near freezing temperatures, can result in crystallization.

If crystallization occurs, reconstitute the component to its original state by temporarily warming it to between 50 and 60 °C [122 and 140 °F]. To ensure full homogeneity, stir the warm component thoroughly, reincorporating all settled material, then re-secure container lid and let cool before use.

Health and Safety

Please see the 834HTC **Safety Data Sheet** (SDS) parts A and B for further details on transportation, storage, handling, safety guidelines, and regulatory compliance.

Application Instructions

For best results, follow the procedure below.

To prepare 5:1 (A:B) epoxy mixture:

- Scrape settled material free from the bottom and sides of **Part A** container; stir material until homogenous.
- Measure **five** parts by volume of the pre-stirred **A**, and pour into the mixing container.
- Measure **one** part by volume of the pre-stirred **B**, and pour slowly into the mixing container while stirring.
- Let sit for 15 minutes to de-air.
—OR—
Put in a vacuum chamber, bring to 25 inHg pressure, and wait for 2 minutes to de-air.
- If bubbles are present at the top, break them gently with the mixing paddle.
- Pour mixture into the mold or container holding the components to be encapsulated.
- Close container tightly between uses to prevent skinning.

ATTENTION! Mixing >500 g [0.4 L] of Part **B** at a time into **A** decreases working life and promotes flash cure. Use of epoxy mixing machines with static stirrers recommended for large volumes. Limit size of hand-mixed batches.

Room temperature cure:

- Let cure at room temperature for 24 hours.



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834HTC

Heat cure:

- Put in oven at 65 °C [149 °F] for 2 hours.
–OR–
- Put in oven at 80 °C [176 °F] for 1 hour.
–OR–
- Put in oven at 100 °C [212 °F] for 30 minutes.

ATTENTION!

Due to exothermic reaction, heat cure temperatures should be at least 25% below the maximum temperature the most fragile PCB component can tolerate. For larger potting blocks, reduce heat cure temperature by greater margins.

Packaging and Supporting Products

<i>Cat. No.</i>	<i>Packaging</i>	<i>Net Volume</i>	<i>Net Weight</i>	<i>Packaged Weight</i>
834HTC-900ML	Can	900 mL 1.9 pt	1.53 kg 3.38 lb	TBD

TBD=to be determined

Technical Support

Please contact us regarding any questions, suggestions for improvements, or problems with this product. Application notes, instructions and FAQs are located at www.mgchemicals.com.

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