

Description

834ATH *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.

834ATH is designed to offer self-extinguishing and moderate thermal conductivity at an economical price. 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.

This epoxy has a convenient 2:1 volume mix ratio, making it compatible with most dispensing equipment. 834ATH can be cured at room temperature or higher.

Benefits and Features

- **Certified UL 94V-0** (File # [E334302](#))
- **Compliant with UL 746A**
- **Cost effective**
- **Convenient 2A:1B volume mix ratio**
- **Low exotherm**
- **High compressive and tensile strength**
- **Excellent adhesion to a wide variety of substrates including metals, composites, glass, ceramics, and many plastics**
- **Excellent Comparative Tracking Index (400 to 599 V, PLC=1)**
- **Excellent electrical insulating characteristics**
- **Broad service temperature range of -40 to 175 °C (-40 to 347 °F)**
- **Solvent-free**



Usage Parameters

<i>Properties</i>	<i>Value</i>
Working Time ^{a)}	2 h
Shelf Life	5 y
Full Cure @22 °C [72 °F]	24 h
Full Cure @80 °C [176 °F]	1 h
Full Cure @100 °C [212 °F]	45 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

<i>Properties</i>	<i>Value</i>
Constant Service Temperature	-40 to 175 °C [-40 to 347 °F]
Max Intermittent Temperature ^{b)}	200 °C [392 °F]
Storage Temperature of Unmixed Parts	16 to 27 °C [61 to 81 °F]

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



834ATH Technical Data Sheet

Flame Retardant Epoxy Encapsulating & Potting Compound

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

834ATH

Principal Components

Name	CAS Number
Part A: Epoxide Resin	25068-38-6 + 68609-97-2
Part B: Curing Amide	68410-23-1 + 112-24-3
Aluminum Trihydrate	21645-51-2
1,1-(ethane-1,2-diyl)bis(pentabromobenzene)	84852-53-9
Antimony Trioxide	1309-64-4

Properties of Cured 834ATH

<i>Physical Properties</i>	<i>Method</i>	<i>Value</i> ^{a)}
Color	Visual	Black
Density @25 °C [77 °F]	—	~1.4 g/cm ³
Hardness	Shore D Durometer	85D
Tensile Elongation	ASTM D 638	6.2%
Tensile Strength	ASTM D 638	28 N/mm ² [4 100 lb/in ²]
Compressive Strength	ASTM D 695	99.8 N/mm ² [14 500 lb/in ²]
Tensile Impact	ASTM D 1822	8.4 kJ/m ² [4.0 ft·lb/in ²]
Izod Impact	ASTM D 256	20 J/m
Lap Shear Strength (Al alloy 5052)	ASTM D 1002	15 N/mm ² [2 000 lb/in ²]
Flexural Strength	ASTM D 790	51 N/mm ² [7 400 lb/in ²]
Water Absorption (WAB)	—	0.15%
Linear Dimension Change after 168 h in water	ASTM D1042	0.0037%
<i>Electrical Properties</i>	<i>Method</i>	<i>Value</i>
Breakdown Voltage @1.514 mm	ASTM D 149	33 kV
Dielectric Strength @1.514 mm	ASTM D 149	22 kV/mm [550 V/mil]
Breakdown Voltage @3.175 mm [1/8"]	Reference fit ^{b)}	47 kV
Dielectric Strength @3.175 mm [1/8"]	Reference fit ^{b)}	15 kV/mm [380 V/mil]
Volume Resistivity @23 °C & 50% RH	ASTM D 257	7 x 10 ¹⁴ Ω·cm
Volume Resistivity @35 °C & 90% RH	ASTM D 257	2 x 10 ¹⁴ Ω·cm
Dielectric Dissipation, D @1 MHz	ASTM D 150-11	0.016
Dielectric Constant, k' @1 MHz	ASTM D 150-11	3.07

Note: Specifications are for epoxy samples cured at 65 °C for 1 hour, 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 five experimental dielectric strengths and interpolated for a standard reference thickness of 1/8" (3.175 mm).



834ATH Technical Data Sheet

Flame Retardant Epoxy Encapsulating & Potting Compound

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

834ATH

Electrical Properties	Method	Value
Comparative Tracking Index (CTI) Performance Level Class (PLC) = 1	ASTM D 3628	400–599 V
Hot Wire Ignition (HWI)	ASTM D3874	120 s
High Voltage Arc Tracking Rate (HVTR)	—	121 mm/min
High Voltage Arc Resistance to Ignition (HVAR)	—	300 s
High Voltage, Low Current, Dry Arc Resistance	ASTM D 495	127 s
High-Current Arc Ignition (HAI)	CSA C22.2	+150 arc
Thermal Properties	Method	Value
Glass Transition Temperature (T _g)	ASTM D 3418	51 °C [124 °F]
Coefficient of Thermal Expansion ^{c)}	—	
Below T _g	ASTM E 831	84 ppm/°C
Above T _g	ASTM E 831	178 ppm/°C
Thermal Conductivity @25 °C [77 °F]	ASTM E 1461	0.37 W/(m·K)
@50 °C [122 °F]	ASTM E 1461	0.40 W/(m·K)
@100 °C [212 °F]	ASTM E 1461	0.36 W/(m·K)
Thermal Diffusivity @25 °C [77 °C]	ASTM E 1461	2.1 x 10 ⁻⁷ m ² /s
Specific Heat Capacity @25 °C [77 °C]	ASTM E 1269 01	1.2 J/(kg·K)
Heat Deflection Temperature	ASTM D 648	54 °C [129 °F]

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

Properties of Uncured 834ATH

Physical Properties	Mixture	
Color	Black	
Viscosity @20 °C [73 °F]	5 900 cP [5.9 Pa·s] ^{a)}	
Density	1.38 g/mL	
Mix Ratio by volume (A:B)	2.0:1.0	
Mix Ratio by weight (A:B)	2.3:1.0	
Physical Properties	Part A	Part B
Color	Black	Black
Viscosity @24 °C [73 °F]	4 600 cP [4.6 Pa·s]	12 900 cP [12.9 Pa·s]
Density	1.44 g/mL	1.26 g/mL
Flash Point	150 °C [302 °F]	185 °C [365 °F]
% Solids	~98%	100%
Odor	Mild aromatic	Ammonia-like

a) Brookfield viscometer at 50 RPM with spindle LV4



834ATH Technical Data Sheet

Flame Retardant Epoxy Encapsulating & Potting Compound


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

834ATH

Compatibility

Adhesion—As seen in the substrate adhesion table, 834ATH 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>
Aluminum	 <p>Stronger</p> <p>Weaker</p>
Steel	
Fiberglass	
Wood	
Paper, Fiber	
Glass	
Rubber	
Polycarbonate	
Acrylic	
Polypropylene ^{a)}	

a) Does not bond to polypropylene

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 834ATH **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 2:1 (A:B) epoxy mixture:

- Scrape settled material free from the bottom and sides of **Part A** container; stir material until homogenous.
- Scrape settled material free from the bottom and sides of **Part B** container; stir material until homogenous.
- Measure **two** 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.

Heat cure:

- Put in oven at 80 °C [176 °F] for 1 hour.
—OR—
- Put in oven at 100 °C [212 °F] for 45 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.



834ATH Technical Data Sheet

Flame Retardant Epoxy Encapsulating & Potting Compound

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

834ATH

Packaging and Supporting Products

<i>Cat. No.</i>	<i>Packaging</i>	<i>Net Volume</i>		<i>Net Weight</i>		<i>Packaged Weight</i>	
834ATH-375ML	Bottle	375 mL	12.6 fl oz	516 g	1.13 lb	0.66 kg	1.46 lb
834ATH-3L	Can	2.55 L	2.69 qt	3.5 kg	7.73 lb	4.52 kg	10 lb
834ATH-60L	Pail	60 L	16 gal	82.5 kg	182 lb	85 kg	187 lb

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.

Email: support@mgchemicals.com

Phone: +(1) 800-340-0772 (Canada, Mexico & USA)

+ (1) 905-331-1396 (International)

+ (44) 1663 362888 (UK & Europe)

Fax: +(1) 905-331-2862 or +(1) 800-340-0773

Mailing address: **Manufacturing & Support**
1210 Corporate Drive
Burlington, Ontario, Canada
L7L 5R6

Head Office
9347-193rd Street
Surrey, British Columbia, Canada
V4N 4E7

Disclaimer

This information is believed to be accurate. It is intended for professional end users who have the skills required to evaluate and use the data properly. *M.G. Chemicals Ltd.* does not guarantee the accuracy of the data and assumes no liability in connection with damages incurred while using it.