MacDermid Alpha
ELECTRONICS SOLUTIONS

# Electrolube® Thermal Interface Materials

Portfolio Overview

THERMAL INTERFACE MATERIALS

macdermidalpha.com

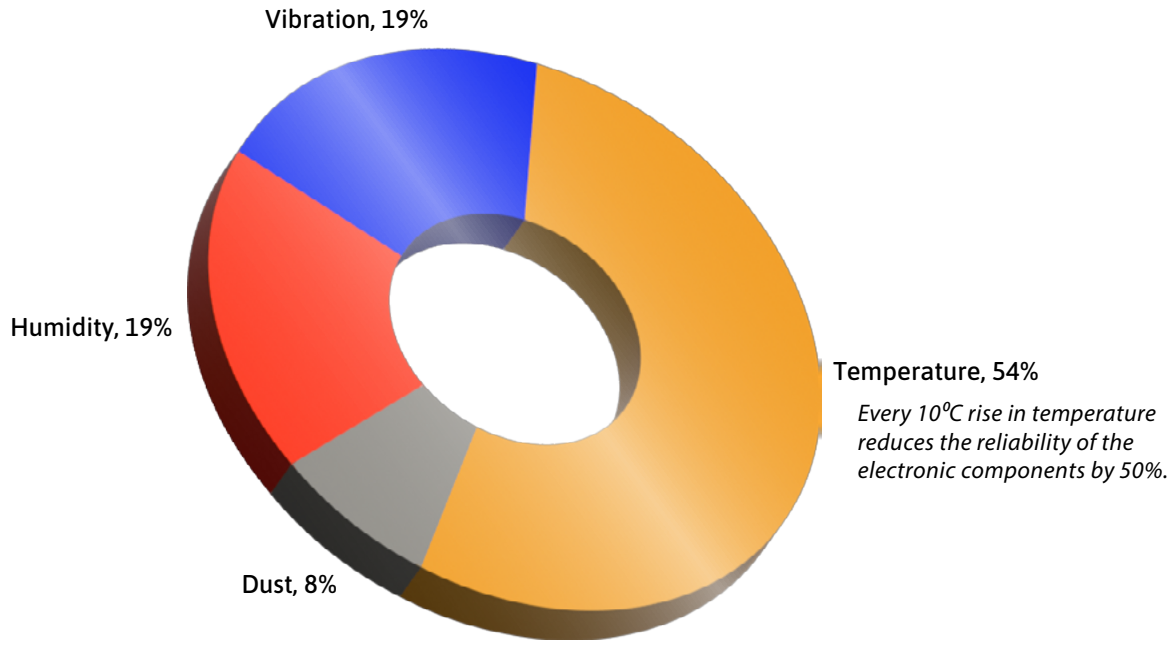
# Electrolube® Thermal Interface Materials

Why Thermal Management Matters

During use, some electronic components can generate significant amounts of heat. Failure to effectively dissipate this heat away from the component and the device can lead to reliability concerns and reduced operational lifetimes.

## Importance of Thermal Management

### Causes of Electronic Failures




## Product Range

### Thermal Interface Materials

**Sheet Applied**

**Liquid Applied**

| Thin Dielectric Sheets | Gap Filling Pads | Thermal Pastes | Pre-Cured Gels | Liquid Gap Fillers |
|---|---|---|---|---|
| • 0.15 - 0.3 mm thickness<br>• Provides high dielectric strength<br>• Available as dual-sided adhesive tape | • 0.5 - 5 mm thickness<br>• Compensates for height differences<br>• Easily reworkable | • 0.04 - 0.1 mm thickness<br>• One-component, uncured<br>• No curing, no mixing required | • 0.1 - 1.5 mm thickness<br>• One-component, pre-cured<br>• Creates very low stress | • 0.1 - 3 mm thickness<br>• Two-component, cures in place<br>• Designed for high volume dispensing |
| **Available in custom-cut sizes** | **Offered in silicone and non-silicone** | **For very low thermal impedance** | **High vertical gap stability** | **Very reliable, no pump-out** |

# Electrolube® Thermal Interface Materials

Liquid Applied Materials

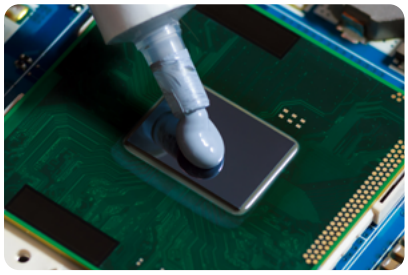
## Thermal Pastes

- One-part, uncured paste
- Silicone and silicone-free solutions
- No post-cure, no mixing required
- Available in various pack sizes for automated application

| Product | Thermal Conductivity (W/m-K) | Chemistry | Density | Viscosity (Pa-s) | Minimum bondline thickness (µm) | Operating Temperature | Dielectric Strength (kV/mm) |
|---|---|---|---|---|---|---|---|
| HTS | 0.9 | Silicone | 2.1 | 215 | 35 | -50 to +200°C | 18 |
| HTSP | 3.0 | Silicone | 3.0 | 45 | 100 | -50 to +200°C | 18 |
| HTC | 0.9 | Non-Silicone | 2.0 | 205 | 35 | -50 to +130°C | 42 |
| HTCP | 2.5 | Non-Silicone | 3.0 | 108 | 100 | -50 to +130°C | 42 |

## Pre-Cured Gel

- One-part, pre-cured paste
- No post-cure, no mixing required
- Enhanced vertical gap stability
- Suitable for automated dispensing



| Product | Thermal Conductivity (W/m-K) | Color | Density | Low-Shear Viscosity (Pa-s) | High-Shear Viscosity (Pa-s) | Dielectric Strength (kV/mm) | Operating Temperature | Bondline Thickness (mm) | Thermal Impedance at 0.1mm thickness (°C-inch²/W) |
|---|---|---|---|---|---|---|---|---|---|
| PCG300 | 3.0 | Blue | 3.0 | 600 | 170 | 12 | -60°C to +180°C | 0.1 to 1.5 | 0.08 |
| PCG400 | 4.0 | Blue | 3.4 | 1000 | 100 | 12 | -60°C to +180°C | 0.1 to 1.5 | 0.07 |

## Liquid Gap Fillers

- Two-part, Cure-in-Place formulation
- 1-to-1 mixing ratio
- No risk of pump-out or shake-out
- Suitable for high-volume automated dispensing

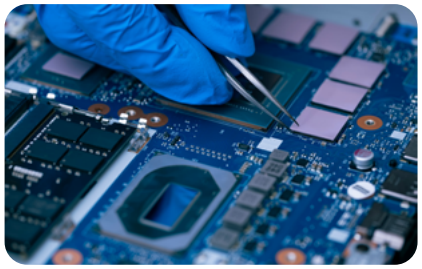
| Product | Thermal Conductivity (W/m-K) | Color | Mix Ratio | Density | Mixed Viscosity (Pa-s) | Cured Hardness (Shore 00) | Dielectric Strength (kV/mm) | Operating Temperature | Cure Time at RT | Cure Time at 100C |
|---|---|---|---|---|---|---|---|---|---|---|
| LGF200 | 2.0 | Gray | 1:1 | 2.6 | 60 | 40 | >10 | -50°C to +200°C | 24 hours | 30 min |
| LGF400 | 4.0 | Blue | 1:1 | 3.0 | 60 | 65 | >10 | -50°C to +200°C | 24 hours | 30 min |
| LGF600 | 6.0 | Pink | 1:1 | 3.2 | 100 | 65 | >10 | -50°C to +200°C | 24 hours | 20 min |

# Electrolube® Thermal Interface Materials

Sheet Applied Materials

## Gap Filling Pads

- Very soft and easily compressible
- Available in custom-cut sizes and shapes
- Silicone and silicone-free formulations
- Additional material thicknesses available upon request

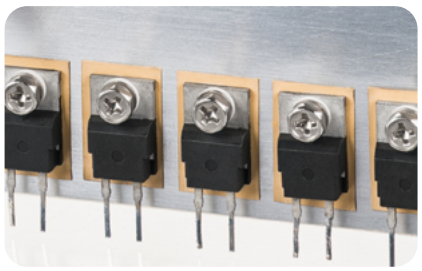


| Product | Thermal Conductivity (W/m-K) | Color | Density | Hardness (Shore 00) | Dielectric Strength (kV/mm) | Operating Temperature | Thickness Range (mm) | Thermal Impedance at 10 psi (°C-inch²/W) |
|---|---|---|---|---|---|---|---|---|
| **GFP150FG** | 1.5 | Pink | 2.6 | 20 | 12 | -60 to +180°C | 0.5 to 5.0 | 1.18 |
| **GFP200** | 2.0 | White | 2.2 | 40 | 11 | -60 to +180°C | 0.5 to 5.0 | 0.72 |
| **GFP300** | 3.0 | Blue | 3.0 | 40 | 12 | -60 to +180°C | 0.5 to 5.0 | 0.58 |
| **GFP400** | 4.0 | Gray | 3.2 | 40 | 12 | -60 to +180°C | 0.5 to 5.0 | 0.33 |
| **GFP500** | 5.0 | Pink | 3.2 | 60 | 12 | -60 to +180°C | 0.5 to 5.0 | 0.35 |
| **GFP600** | 6.0 | Gray | 3.3 | 60 | 12 | -60 to +180°C | 0.5 to 5.0 | 0.31 |
| **GFP850** | 8.5 | Gray-Green | 3.6 | 35 | 8 | -60 to +180°C | 1.0 to 5.0 | 0.18 |
| **GFP500NS*** | 5.0 | Gray | 3.3 | 60 | 8 | -60 to +125°C | 0.5 to 5.0 | 0.37 |

**Silicone-Free*

## Thin Dielectric Sheets

- Featuring Fiberglass or Polyimide reinforcement
- Double-sided adhesive tape with high bonding strength
- Polyimide reinforcement for high dielectric strength (12kV)
- Available in custom-cut shapes and dimensions



| Product | Description | Thermal Conductivity (W/m-K) | Reinforcement Layer | Dielectric Strength (kV/mm) | Material Thickness (mm) | Thermal Impedance at 20 psi (°C-inch²/W) | Operating Temperature |
|---|---|---|---|---|---|---|---|
| **TDS100P** | Dielectric Sheet | 1 | Polyimide | 12 | 0.15 | 0.31 | -60 to +180°C |
| **TDS120FG** | Dielectric Sheet | 1.2 | Fiberglass | 4 | 0.20 | 0.36 | -60 to +180°C |
| **ACT090FG** | Adhesive Tape | 0.9 | Fiberglass | 2 / 3 | 0.15 / 0.25 | 0.47 / 0.781 | -60 to +120°C |

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techinfo@macdermidalpha.com

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