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## Thermal Adhesives &amp; Epoxies

Thermal adhesives and epoxies offer high heat transfer and high voltage isolation. These compounds offer low shrinkage and coefficients of thermal expansion comparable to copper or aluminum. They bond readily to metals, ceramics, most plastics and a wide variety of other materials. The bond can also eliminate the need for mounting hardware or attachments.

## Ther-O-Bond 1500

Extremely versatile epoxy casting mix developed for high thermal performance and adhesion.

## Thermalbond

High strength epoxy that provides optimized adhesion to copper, aluminum, steel, glass, ceramics and most plastics.

## Ther-O-Bond 1600


Durable, thermally conductive, high-impact bonding agent designed for smaller applications.

## Ther-O-Bond 1500

[SDS Safety Sheet for Ther-O-Bond 1500 Resin](#)

[SDS Safety Sheet for Ther-O-Bond 1500 Hardener](#)

Ther-O-Bond 1500 utilizes versatile two-part epoxy casting system developed for high performance, production potting and encapsulating applications where low shrinkage and rapid air evacuation are required. This formulation has a flowable viscosity and a very low surface tension which affords excellent air release. It can be readily machined and shaped with ordinary shop tools and bonds easily to rigid plastics, laminates, metals and ceramics. When fully cured this epoxy system is an excellent electrical insulator and conductor of heat while providing resistance to electrolysis, leakage, corrosion, water damage, weather, gases, chemicals and most hazards associated with harsh environments.

| Part Number   | PCN   | Package            | Size                |
|---------------|---|--------------------|---------------------|
| 159900F00000G |  | Resin and Hardener | 0.946 liter (1 Qt.) |

## Handling Characteristics

|   |             |
|---|-------------|
| Mix Ratio by Weight, Resin to Hardener: | 100 to 15   |
| Mixed Viscosity @ 25°C, cps:            | 1000 - 1500 |
| Work-Life @ 25°C                        | 45 Minutes  |
| Gel Time @ 25°C                         | 3-6 Hours   |
| Cure Schedule @ 25°C                    | 8 Hours     |
| Cure Schedule @ 65°C                    | 1 Hour      |
| Cure Schedule @ 100°C                   | 0.5 Hour    |

## Physical Properties

|                                   |            |
|-----------------------------------|------------|
| Color                             | Black      |
| Specific Gravity                  | 1.50       |
| Operating Temp, °C                | -60 to 155 |
| Heat Distortion Temp, °C          | 100        |
| Hardness, Shore D:                | 88         |
| Thermal Conductivity W/(m°C)      | 1.26       |
| Compressive Strength, psi         | 14,000     |
| Dissipation Factor, 100 KHz @25°C | 0.01       |

|                                 |             |
|---------------------------------|-------------|
| Self Extinguishing?:            | yes         |
| C.T.E. (ppm/°C)                 | 25          |
| Tensile Strength (@25°C)        | 9200 psi    |
| Dielectric Strength (volts/mil) | 800         |
| Shelf Life (DOM)                | 8 months(1) |

(1) Stated shelf life is from date of manufacture. To allow for inventory cycle, product shipped from Aavid will have less than 12 months remaining shelf life. Aavid guarantees a minimum of 3 months remaining shelf life. Please adjust order quantity so all product will be consumed with in 3 months of date of shipment.

### Ther-O-Bond 1500 Resistance Calculator

|   |  |
|---|--|
| Enter the area of the device that will contact the heat sink: | <input type="text"/> mm2                 |
| Enter the grease thickness:                                   | <input type="text"/> mm                  |
|   | <input type="button" value="Calculate"/> |
| Interface Resistance =  | <input type="text"/>                     |

#### Formula

$$\frac{\text{interface resistance= interface thickness (mm) * 1000}}{\text{thermal conductivity (W/m-K) * contact area (mm}^2\text{)}}$$

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## Ther-O-Bond 1600

[SDS Safety Sheet for Ther-O-Bond 1600 Resin in PDF format](#)  
[SDS Safety Sheet for Ther-O-Bond 1600 Hardener in PDF format](#)

Ideal for smaller applications, Ther-O-Bond 1600 is a two part system that produces a stable, high-impact bond at room temperature with good heat transfer characteristics and electrical isolation. Once mixed, it becomes a thermally conductive thixotropic compound that can be used for potting thermistors, diodes, resistors, integrated circuits and other heat sensitive components into printed circuit boards. The compound bonds readily to itself, metals, ceramics, silica, steatite, alumina, sapphire, glass, plastics and a number of other materials due to its compatible coefficient for thermal expansion.

### Ordering Information

| Part Number   | PCN   | Package            | Size            | Buy Now   |
|---------------|---|--------------------|-----------------|---|
| 161000F00000G |  | 2-Part Plastic Kit | 10gm (0.35 oz.) |  |
| 164000F00000G |  | 2-Part Plastic Kit | 40gm (1.40 oz.) |   |

### Handling Characteristics

|   |            |
|---|------------|
| Mix Ratio by Weight, Resin to Hardener: | 100 to 5   |
| Mixed Viscosity @ 25°C, cps:            | 33,000     |
| Work-Life @ 25°C                        | 45 Minutes |
| Gel Time @ 25°C                         | 3-6 Hours  |
| Cure Schedule @ 25°C                    | 8 Hours    |
| Cure Schedule @ 65°C                    | 1 Hour     |
| Cure Schedule @ 100°C                   | 0.5 Hour   |

### Physical Properties

|                    |            |
|--------------------|------------|
| Color              | Blue       |
| Specific Gravity:  | 2.30       |
| Operating Temp, °C | -70 to 115 |
| Hardness, Shore D: | 90         |

|                                    |            |
|------------------------------------|------------|
| Izod impact, F1 Lbs/Inch of Notch  | 0.49       |
| Thermal Conductivity W/(m-°C)      | 0.85       |
| C.T.E. (ppm/°C)                    | 25         |
| Tensile Strength (@25°C)           | 9200 psi   |
| Tensile Lap Shear, psi             | 2900       |
| Dielectric Strength (volts/mil)    | 410        |
| Dielectric Constant (1 KHz @ 25°C) | 5.9        |
| Dissipation Factor, KH@ 25°C       | 5.9        |
| Shelf Life (DOM)                   | 18 months1 |

(1) Stated shelf life is from date of manufacture. To allow for inventory cycle, product shipped from Aavid will have less than 12 months remaining shelf life. Aavid guarantees a minimum of 3 months remaining shelf life. Please adjust order quantity so all product will be consumed with in 3 months of date of shipment.

#### Ther-O-Bond 1600 Resistance Calculator










|   |  |
|---|--|
| Enter the area of the device that will contact the heat sink: | <input type="text"/> mm2                 |
| Enter the grease thickness:                                   | <input type="text"/> mm                  |
|   | <input type="button" value="Calculate"/> |
| Interface Resistance =  | <input type="text"/>                     |

#### Formula

$$\text{interface resistance} = \frac{\text{interface thickness (mm)} * 1000}{\text{thermal conductivity (W/m-K)} * \text{contact area (mm}^2\text{)}}$$

### Thermalbond

Thermalbond is a compound created using a two part epoxy resin system. It provides exceptional adhesion to copper, aluminum, steel, glass, ceramics and most plastics while possessing a coefficient of thermal expansion that is extremely compatible with aluminum, copper and brass. Once cured, Thermalbond is exceptionally resistant to environmental hazards.

| Part Number                | PCN   | Net Weight                                   | SDS            | Buy Now   |
|----------------------------|---|--|----------------|---|
| 4949G                      |  | 25 grams (0.875 oz)<br>in single use package | Hardener Epoxy |  |
| 4950G<br>Part Discontinued |  | 50 grams (1.75 oz)<br>in single use package  | Hardener Epoxy |   |
| 4951G                      |  | 100 grams (3.5 oz)<br>in single use package  | Hardener Epoxy |  |
| 4952G                      |  | 200 grams (7.0 oz)<br>in single use package  | Hardener Epoxy |  |
| 4953G                      |  | 3.25 lbs.                                    | Hardener Epoxy |  |

**Note:** Matched quantity of RT-7 hardener is included.

#### Mixing Instructions:

Mix resin thoroughly before removing material. Add 7.1 parts of RT-7 hardner to 100 parts of resin by weight, or 17 parts of

RT-7 hardener to 100 parts of resin by volume. Adhesive will set up in:  
 24 hrs at 25°C (77°F) 1 hr. at 100C (212°F)  
 2 hrs. at 65°C (149°F) 30min. at 130°C (266°F)

**Note:** For maximum electrical and physical properties, a post cure is necessary. Post cure at room temperature for 4 days or for 4 hours at 93°C (200°F).

#### Typical Electrical and Physical Properties at Room Temperature with RT-7 Hardener

| Characteristics  | Typical Values                       |
|--|--------------------------------------|
| Specific gravity   | 2.35                                 |
| Working viscosity  | 25,000 cps                           |
| Thermal conductivity                                     | 1.34W/m-1°C-1<br>(0.77 Btu/hr ft °F) |
| Thermal resistivity                                      | 29.4°C in/watt                       |
| Tensile strength   | 6.34 x 107Pa(9,200 psi)              |
| Compressive strength                                     | 1.44 x 108Pa(20,900 psi)             |
| Bond shear strength                                      | 3.17 x 107Pa(4,600 psi)              |
| aluminum to aluminum, 25.4mm (1") overlap @ 25°C, (77°F) |                                      |
| Thermal coefficient of expansion                         | 24 x 10-6/°C (13.2 x 10-6/°F)        |
| Water absorption, % after 10 days@ 25°C (77°F)           | .20                                  |
| Hardness, Shore D  | 86                                   |
| Volume resistivity                                       | 1.0 x 1016                           |
| Dielectric strength                                      | 59.1 x 103volts/mm (1500 volts/mil)  |
| Dielectric constant@25°C (77°F) 100KHz                   | 6.1                                  |
| Dielectric factor@25°C (77°F) 100KHz                     | 0.020                                |
| Operating temperatures                                   | -65°C to 155°C (-85°F to 311°F)      |
| Linear shrinkage   | 0.002 in/in                          |
| Shelf life (DOM)   | 12 months1                           |
| Pot life@25°C (77°F)                                     | 2-3 hours                            |
| Suggested stripping agent                                | Miller-Stephenson MS 111             |
| Cleaning solvent   | Acetone                              |

(1) Stated shelf life is from date of manufacture. To allow for inventory cycle, product shipped from Aavid will have less than 12 months remaining shelf life. Aavid guarantees a minimum of 3 months remaining shelf life. Please adjust order quantity so all product will be consumed within 3 months of date of shipment.

#### Thermalbond Resistance Calculator

|   |  |
|---|--|
| Enter the area of the device that will contact the heat sink: | <input type="text"/> mm <sup>2</sup>     |
| Enter the grease thickness:                                   | <input type="text"/> mm                  |
|   | <input type="button" value="Calculate"/> |
| Interface Resistance =  | <input type="text"/>                     |

#### Formula

$$\text{interface resistance} = \frac{\text{interface thickness (mm)} * 1000}{\text{thermal conductivity (W/m-K)} * \text{contact area (mm}^2\text{)}}$$

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