

# 127-20 THERMAL INTERFACE MATERIAL DATA SHEET

## EXTREME PERFORMANCE PHASE CHANGE THERMAL COMPOUND

The **127-20 Series** is an advanced thermal interface material, formulated as a hybrid phase change material without diluents or solvents for optimal performance. This dispensable, screen-printable compound achieves ultra-low bond line thickness and unmatched thermal conductivity.

Engineered to resist pump-out, outgassing and phase separation, the **127-20 Series** eliminates concerns over silicone deposition on sensitive optics and electronics. It meets the demanding thermal and reliability needs of high-speed chipsets and graphic processors while remaining halogen-free and fully RoHS and REACH compliant.

With its stay-put viscosity, **The 127-20 Series** is ideal for precision application in the most complex assemblies. Experience thermal excellence with no tradeoffs in stability or safety - upgrade to our **127-20 Series** for your next-generation designs.

### FEATURES

- High thermal conductivity on par with metallic TIMs (20 W/m-K)
- Non-evaporative materials with minimal pump out
- Nonconducting & nonreactive for use on any alloy/metal
- Ultra-low BLT
- 2.5 Year shelf life

### APPLICATIONS

- Interface for semiconductors requiring low pressure or spring clamp mounting
- Thermal sensors, TEC modules, thermal wells
- IGBT's, LED
- Power Transistors, diodes, power resistors

### SIZE

Part Number: **127-20** (10cc Syringe) (1 Gram of Material)  
Other sizes available upon request



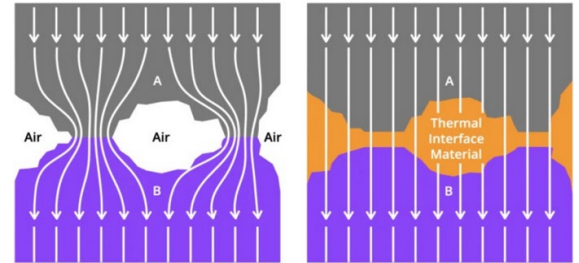
| TYPICAL PROPERTY                  | RESULTS   |
|-----------------------------------|---|
| Type                              | Silicone free, hybrid phase change paste                |
| Special feature                   | Extreme thermal conductivity. Zero pump out. No-solvent |
| Color                             | Light grey  |
| Viscosity, cps                    | 280000  |
| Specific gravity                  | 2.5   |
| Operating temperature range °C    | -50°C to 200°C  |
| Shelf life @25C                   | 2.5 Years   |
| Bondline Thickness                | 4-10 microns (Preferred)<br>100 microns maximum         |
| <b>THERMAL</b>                    |   |
| Thermal conductivity (W/m-K)      | 12 and 20   |
| Recommended maximum temperature   | 130°C   |
| Phase change and cure temperature | 50°C (122°F)  |
| <b>ELECTRICAL</b>                 |   |
| Breakdown voltage (VAC/mil)       | 200   |
| Outgassing, % TML                 | 0.15% TML   |
| Volume resistivity                | 10 <sup>14</sup> ohm-cm                                 |

**Disclaimer:** All statements, technical information, and recommendations related to Wakefield Thermal products are based on information believed to be reliable, but accuracy or completeness is not guaranteed. Before using this product, you must evaluate it and determine if it is suitable for your intended application. You must assume all risks and liability associated with such use. Wakefield Thermal will not be liable for any indirect, special, incidental or consequential loss or damage arising from this product, regardless of legal theory asserted.

**Installation Instructions:** 1. Thoroughly clean and dry the mating surfaces with Isopropyl alcohol. 2. Apply a thin layer of thermal compound to achieve 4-10 micron thickness. 3. Join surfaces while gently rotating to spread the compound evenly. 4. Apply continuous pressure of at least 30 kPa to fully mate surfaces without separating the two surfaces. 5. Thermal cycle above 50°C to fully cure and activate the phase change properties.

**Safety Information:** Should be used with caution. Avoid contact with eyes and skin by wearing gloves and safety goggles. Do not ingest. Read all safety data sheets and instructions thoroughly prior to use.

127 Series of thermal compound - representing a new era in thermal interface materials. This innovative formula delivers best-in-class thermal conductivity without compromising on longevity and stability. The 127 Series is engineered to prevent pump-out and phase separation. With an ideal viscosity for precision dispensing and screen-printing, the 127 Series wets surfaces thoroughly for superior heat transfer in even the most complex and demanding assemblies.



Schematic representing two surfaces (A&B) in contact and heat flow across interface without (left) and with thermal interface material applied (right)

| Property                                 | Value  |
|--|--|
| <b>Type</b>                              | Silicone free, Hybrid Phase Change thermal compound      |
| <b>Special Features</b>                  | Extreme thermal conductivity, zero pump out, non-solvent |
| <b>Color</b>                             | Light Gray   |
| <b>Viscosity, cps</b>                    | 280000   |
| <b>Phase change and cure temperature</b> | Above 122 °F (50 °C)                                     |
| <b>Cure time</b>                         | 1 Thermal cycle  |
| <b>Operating Temperature Range</b>       | -58 to 392 °F<br>(-50 to 200 °C)                         |
| <b>Shelf Life (at 25°C) unopened</b>     | 30 Months  |
| <b>Thermal Conductivity</b>              | 12, 20 W/m-K   |
| <b>Breakdown Voltage</b>                 | 200 VAC/mil  |
| <b>Volume Resistivity</b>                | 10 <sup>14</sup> ohm-cm                                  |
| <b>Bondline Thickness</b>                | 157 - 394 micro inches<br>(4-10 microns)                 |
| <b>Maximum Surface Roughness, Ra</b>     | 118 - 1969 micro inches<br>(3-50 µm - ISO Grade N12)     |
| <b>Outgassing, % TML</b>                 | 0.15 % TML   |

**Non Evaporative** - very limited pump-out even at high frequency temperature range applications.

**Non Volatile** - stable performance for an extended period of time.

**Non Reactive** - does not react with metals and alloys.

**Non Conductive** - does not conduct electricity

**Features and Benefits:**

- ★ Compatible with Optics
- ★ Environmentally friendly solution that meets regulatory requirements (RoHS & REACH)
- ★ Easy rework

**MARKETS:**

- Semiconductor Packaging
- Machined heatsinks
- Notebooks / Portables / Servers
- Liquid Cooling
- Photonics / Lasers
- IGBTs : SiC / GaN
- Automotive
- Memory Modules



## Installation Instructions

1. Thoroughly clean the mating surfaces with isopropyl alcohol, polish if necessary. Let dry completely. Both of the mating surfaces should be flat not exceeding ISO grade N12 (50  $\mu\text{m}$ ).
2. Apply 127 compound to both surfaces evenly to achieve a 157 - 394 micro inches (4-10 micron) bond line thickness. Do not expose to air more than 2 minutes.
3. Join the surfaces together while gently rotating and sliding to ensuring the spread of compound evenly.
4. Apply continuous pressure of at least 30 kPa to fully mate the surfaces without separating, if separated wipe off compound and start over.
5. The thermal interface compound cures and activates its phase change properties when heated above 50°C during thermal cycling.

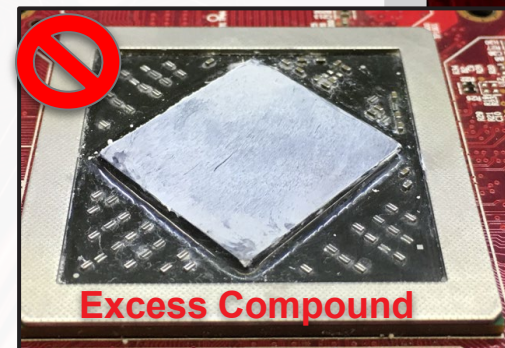
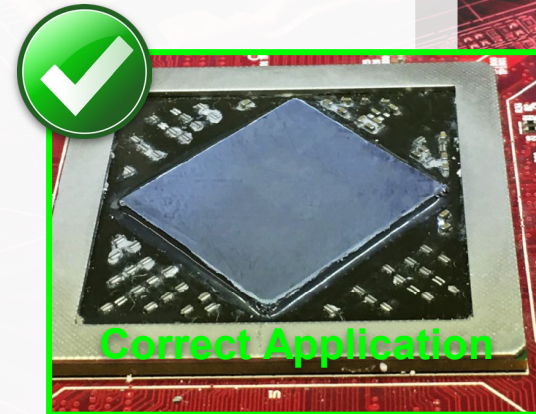
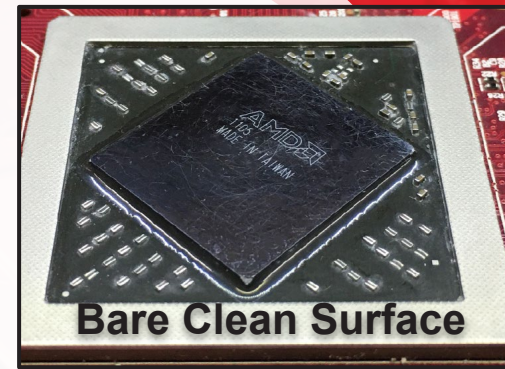
## Safety Information

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## Storage Conditions

Store in original packaging, with vacuum packaging intact away from direct heat and UV at standard warehouse temperatures between 15-35° C

- Shelf Life once opened: 30 days when stored at 20-35°C & maximum 50% RH
- Shelf Life unopened: 2.5 years from date of manufacture
  - *Date of Manufacture (MFG) printed on bottom left portion on the back of packaging*

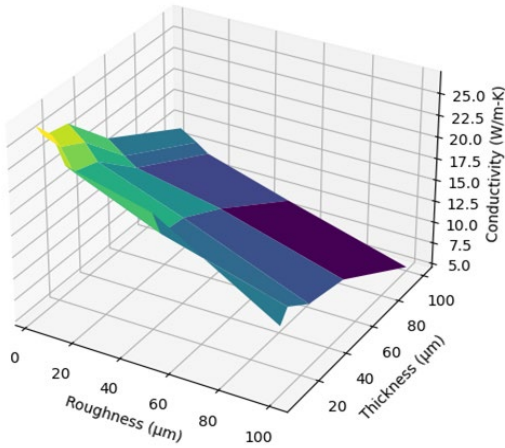


## Impact of Surface Roughness (Ra) and Compound Thickness on Thermal Conductivity

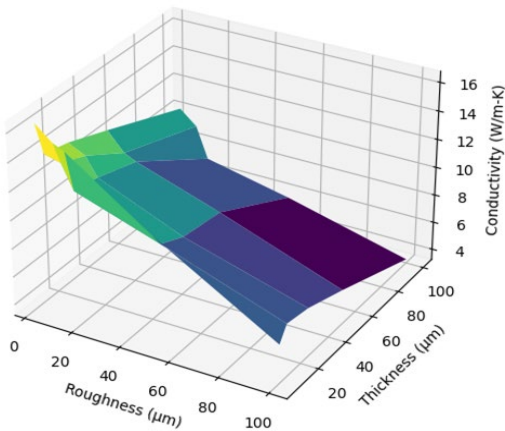
The conductivity vs roughness/thickness chart highlights the significant impact that surface conditions and application method can have on thermal compound performance. The z-axis shows measured conductivity while the x- and y-axis represent surface roughness and bond line thickness respectively. The sharp drop off in performance as roughness increases demonstrates the importance of smooth mating surfaces.

We encourage customers to take advantage of guidance on surface prep and thickness control, ensuring proper application that will maximize the rated conductivity of materials.

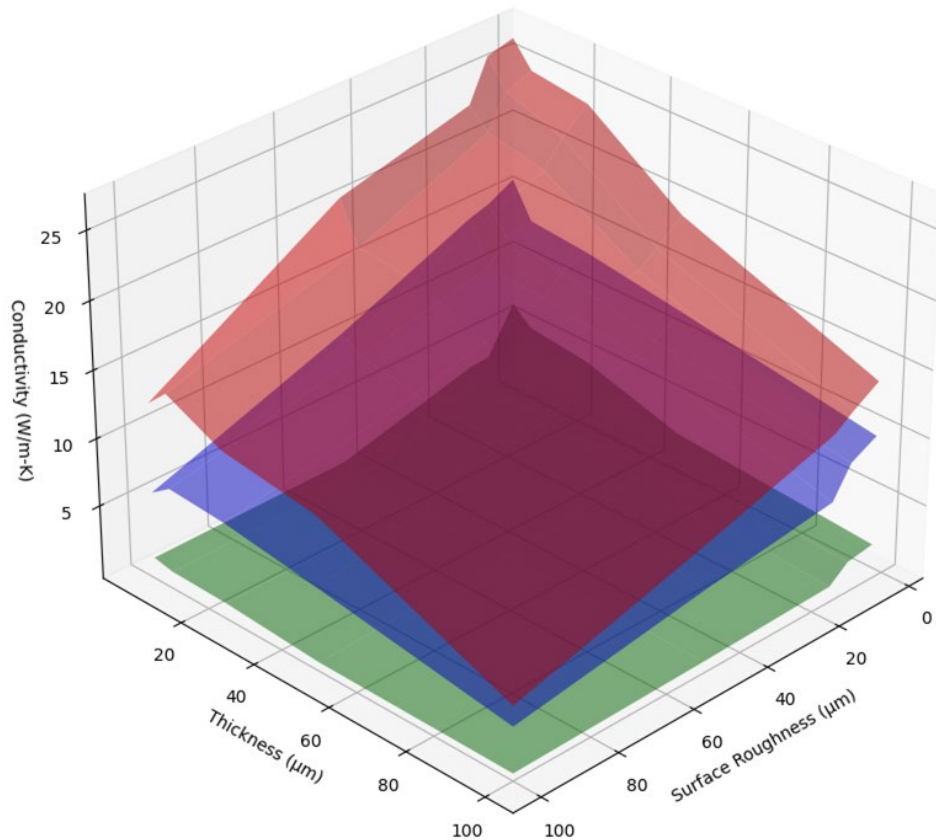
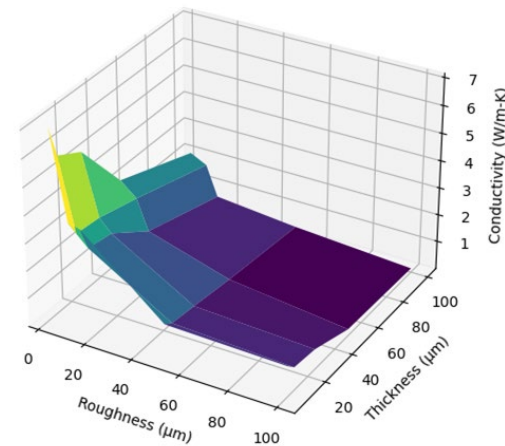
127-20-10



127-12-10



6WmK Grease



- PN: 127-20-10
- PN: 127-12-10
- 6W/m-k Grease