

T-work9000

High Thermal Conductive Gap Filler

LiPOLY T-work9000 offers outstanding thermal conductivity at 20.0 W/m*K and extremely low thermal resistance under minimal force. T-work9000 offers excellent compression, filling small air gaps on uneven surfaces, ensuring an efficient and consistent transfer of heat.

■ FEATURES

- / Thermal conductivity: 20.0 W/m*K
- / High compression rate
- / Extremely low thermal impedance

■ TYPICAL APPLICATION

- / Between CPU and heat sink
- / Between a component and heat sink
- / Flat-panel displays
- / Power supplies
- / High speed mass storage drives
- / Telecommunication hardware



■ CONSTRUCTION

| Series | Characteristics | Configurations |
|------------|--|-----------------------------|
| T-work9000 | Silicone compound with weak sticky surfaces. | Sheets form, Die-cuts parts |

■ TYPICAL PROPERTIES

| PROPERTY | T-work9000 | TEST METHOD | UNIT |
|---|--------------------------|-------------------|------------------------|
| Color | Brown | Visual | - |
| Surface tack 2-side/1-side | 2 | - | - |
| Thickness | Customized | ASTM D374 | mm |
| Density | 3.3 | ASTM D792 | g/cm ³ |
| Hardness | 65 | ASTM D2240 | Shore 000 |
| TML | <0.1 | By LiPOLY | % |
| Application temperature | -60~150 | - | °C |
| ROHS & REACH | Compliant | - | - |
| COMPRESSION | | | |
| Deflection @10 psi | 12 | ASTM D5470 modify | % |
| Deflection @20 psi | 27 | ASTM D5470 modify | % |
| Deflection @30 psi | 58 | ASTM D5470 modify | % |
| Deflection @40 psi | 71 | ASTM D5470 modify | % |
| Deflection @50 psi | 74 | ASTM D5470 modify | % |
| ELECTRICAL | | | |
| Dielectric breakdown | 8 | ASTM D149 | KV/mm |
| Surface resistivity | >10 ¹¹ | ASTM D257 | Ohm |
| Volume resistivity | >10 ¹⁰ | ASTM D257 | Ohm-m |
| Dielectric constant@10MHz D _k | 10.5 | ASTM D150 | - |
| Dielectric constant@1GHz D _k | 10.4 | ASTM D150 | - |
| Dielectric constant@1.8GHz D _k | 11.2 | ASTM D150 | - |
| Dielectric factor@10MHz D _f | 0.001 | ASTM D150 | - |
| Dielectric factor@1GHz D _f | 0.006 | ASTM D150 | - |
| Dielectric factor@1.8GHz D _f | 0.022 | ASTM D150 | - |
| THERMAL | | | |
| Thermal conductivity | 20.0 | ASTM D5470 | W/m*K |
| Thermal conductivity | 12.0 | ISO 22007-2 | W/m*K |
| Thermal impedance@10psi | 0.110 | ASTM D5470 | °C-in ² / W |
| Thermal impedance@20psi | 0.088 | ASTM D5470 | °C-in ² / W |
| Thermal impedance@30psi | 0.050 | ASTM D5470 | °C-in ² / W |
| Thermal impedance@40psi | 0.037 | ASTM D5470 | °C-in ² / W |
| Thermal impedance@50psi | 0.031 | ASTM D5470 | °C-in ² / W |
| Coefficient of thermal expansion | -538.70x10 ⁻⁶ | ASTM E228 | 1/K |

■ THERMAL IMPEDANCE & COMPRESSION

| Compression Force (psi) | Thermal Impedance (°C-in ² /W) | | | Compression (%) | | |
|-------------------------|---|--------|--------|-----------------|--------|--------|
| | 1.0 mm | 2.0 mm | 3.0 mm | 1.0 mm | 2.0 mm | 3.0 mm |
| 10 | 0.110 | 0.201 | 0.255 | 12 | 21 | 31 |
| 20 | 0.088 | 0.105 | 0.120 | 27 | 55 | 68 |
| 30 | 0.050 | 0.056 | 0.064 | 58 | 78 | 83 |
| 40 | 0.037 | 0.039 | 0.042 | 71 | 85 | 89 |
| 50 | 0.031 | 0.033 | 0.035 | 74 | 86 | 90 |

Test method: ASTM D5470

■ RELIABILITY

| Test Property | Compression Force (psi) | 70°C | | | | |
|--------------------|-------------------------|---------|---------|---------|---------|----------|
| | | Initial | 100 hrs | 250 hrs | 500 hrs | 1000 hrs |
| Thermal Resistance | 10 | 0.110 | 0.111 | 0.112 | 0.112 | 0.113 |
| | 30 | 0.050 | 0.051 | 0.052 | 0.052 | 0.053 |
| | 50 | 0.031 | 0.031 | 0.032 | 0.032 | 0.033 |

| Test Property | Compression Force (psi) | 150°C | | | | |
|--------------------|-------------------------|---------|---------|---------|---------|----------|
| | | Initial | 100 hrs | 250 hrs | 500 hrs | 1000 hrs |
| Thermal Resistance | 10 | 0.110 | 0.111 | 0.112 | 0.113 | 0.113 |
| | 30 | 0.050 | 0.051 | 0.052 | 0.053 | 0.053 |
| | 50 | 0.031 | 0.032 | 0.032 | 0.033 | 0.033 |

| Test Property | Compression Force (psi) | 60°C / 90%RH | | | | |
|--------------------|-------------------------|--------------|---------|---------|---------|----------|
| | | Initial | 100 hrs | 250 hrs | 500 hrs | 1000 hrs |
| Thermal Resistance | 10 | 0.110 | 0.111 | 0.112 | 0.113 | 0.113 |
| | 30 | 0.050 | 0.051 | 0.052 | 0.053 | 0.053 |
| | 50 | 0.031 | 0.032 | 0.032 | 0.033 | 0.033 |

| Test Property | Compression Force (psi) | -40°C (30min) ↔ +125°C (30min) | | | | | |
|--------------------|-------------------------|--------------------------------|------------|------------|------------|------------|------------|
| | | 0 Cycles | 100 Cycles | 200 Cycles | 300 Cycles | 400 Cycles | 500 Cycles |
| Thermal Resistance | 10 | 0.110 | 0.110 | 0.111 | 0.112 | 0.113 | 0.113 |
| | 30 | 0.050 | 0.050 | 0.051 | 0.052 | 0.052 | 0.053 |
| | 50 | 0.031 | 0.032 | 0.031 | 0.032 | 0.032 | 0.033 |

| Test Property | Compression Force (psi) | Ultra Low Temperature -60°C | | | | | |
|--------------------|-------------------------|-----------------------------|---------|---------|---------|---------|---------|
| | | Initial | 100 hrs | 200 hrs | 300 hrs | 400 hrs | 500 hrs |
| Thermal Resistance | 10 | 0.110 | 0.110 | 0.111 | 0.110 | 0.111 | 0.110 |
| | 30 | 0.050 | 0.051 | 0.050 | 0.051 | 0.050 | 0.050 |
| | 50 | 0.031 | 0.031 | 0.032 | 0.032 | 0.032 | 0.031 |

Test method: ASTM D5470 , Specimen thickness = 1.0mm , Unit: °C-in²/W

Note: All specifications provided by LiPOLY are subject to change without notice. The test methods used by LiPOLY are based on the TIM Tester method and ASTM D5470 test method. These test methods are used as the definition standards for LiPOLY. Property values provided in this document are not for product specifications or guaranteed. This document does not guarantee the performance and quality required for the purchaser's specific purpose. The purchaser needs to evaluate and verify the safety before using the material. We strongly recommend the purchaser pre-test the product and verify the performance of the product under the purchaser's specific conditions. Liability and use of the product are the responsibility of the end user. LiPOLY makes no warranty as to the suitability, merchantability, or non-infringement of any LiPOLY material or product for any specific or general uses. LiPOLY shall not be liable for incidental or consequential damages of any kind. All LiPOLY products are sold in accordance with the LiPOLY Terms and Conditions in effect at the time of purchase and a copy of which will be furnished upon request. All rights reserved, including LiPOLY trademarks or registered trademarks of LiPOLY or its affiliates. Statements concerning possible or suggested uses made herein shall not be relied upon or be construed as a guaranty of patent infringement. Copyright 2022 LiPOLY.