

## TIMbber™ ALT-304 Series High Reliability TIM Preliminary Data Sheet

**Description**

Ariecca’s ALT series of Liquid Metal Embedded Elastomer (LMEE) Thermal Interface Materials (TIM) are specifically designed for applications that require high reliability. The ALT series fill the matrix of a highly adhesive, stretchable elastomer with thermally conductive liquid metal droplets. This enables extremely high reliability, as the liquid metal maintains the base polymer’s mechanical properties. Using liquid metal droplets as fillers, additionally, provides the ability to achieve low BLT (<20µm) inside the package with available assembly pressures. Reliability performance has been demonstrated with thin bond line thicknesses of less than 20µm. The ALT304 is optimized for high-force magazine and stencil printing manufacturing methods.

**Key Features**

- Low thermal resistance
- Extremely high adhesion
- Low BLT
- Extreme elongation
- High reliability (HTS, HAST, shock and vibration, pump out)
- High operating temperature stability
- Single component, thermally curable
- Solvent free
- Electrical isolation

**Nominal Properties<sup>1</sup>**

Thermal Resistance <sup>2</sup> (mm <sup>2</sup> K/W) @ BLT < 30µm	< 7
Complex Viscosity <sup>3</sup> (Pa.s) @ 10 rad/sec, ε=5%	190
Adhesion <sup>4</sup> (N/m)	> 35
Strain at Break <sup>5</sup> (%)	> 200
Operating Temperature Range (°C)	-55 ↔ 200
Working Time (hours)	> 8

<sup>1</sup> The ALT-304 series are currently in production and engineering samples can be evaluated with an NDA in place. All specifications are nominal and have not been statistically validated.

<sup>2</sup> Measured on ASTM D5470 TIMA test apparatus [www.nanotest.eu/tima](http://www.nanotest.eu/tima)

<sup>3</sup> Measured using TA HR10 Rheometer, 5 measurements from different batches [www.tainstruments.com/hr-10/](http://www.tainstruments.com/hr-10/)

<sup>4</sup> Measured 180-Peel test with TIMbber™ applied to nickel plate

<sup>5</sup> Measured using Mark-10 with TIMbber™ sample cured in dog-bone shape [www.mark-10.com/](http://www.mark-10.com/)

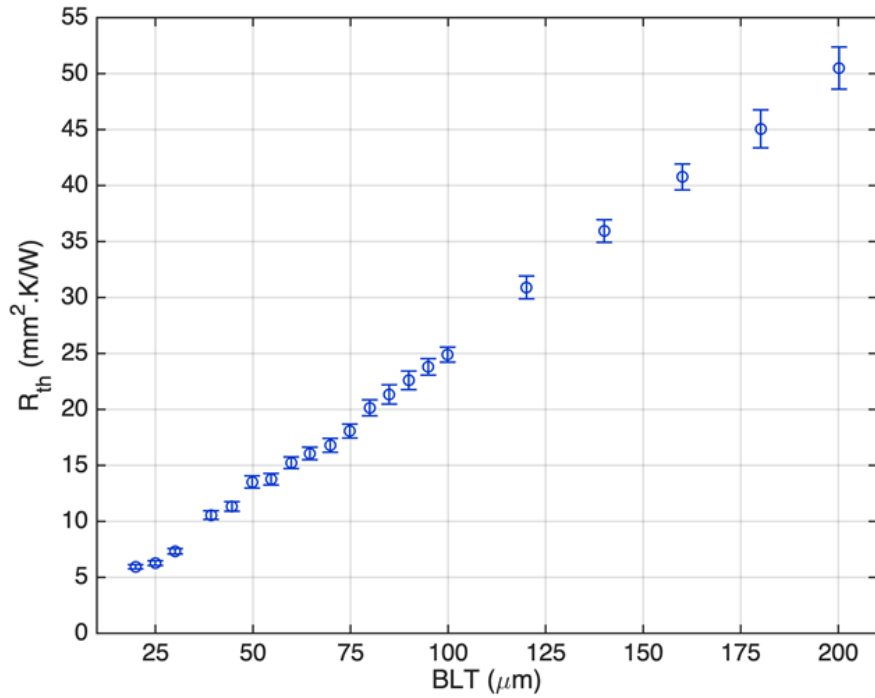


Figure 1: ASTM D5470 Thermal Resistance vs. BLT

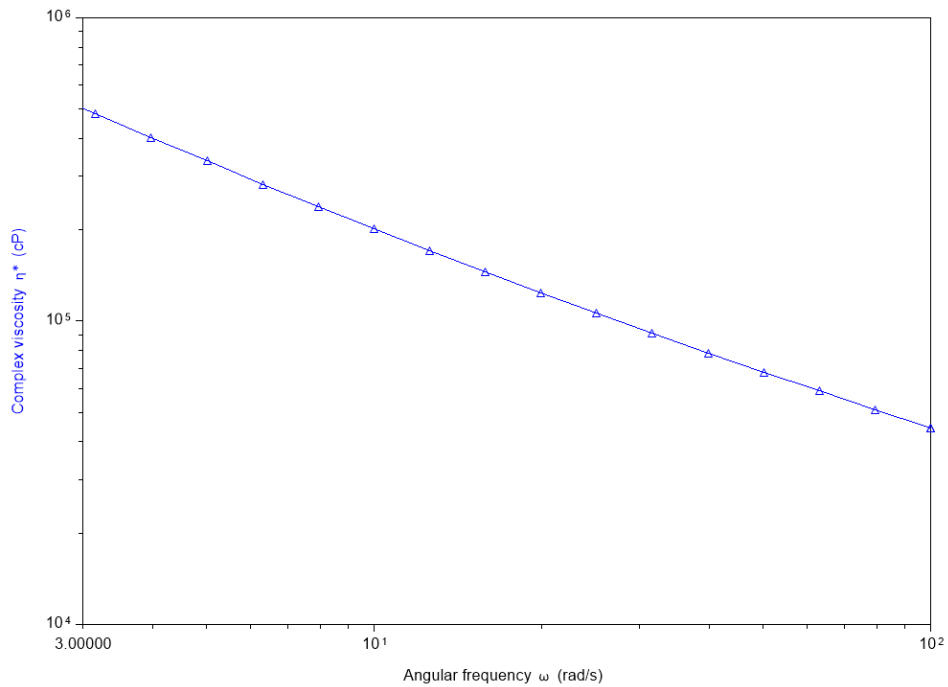


Figure 2: Complex Viscosity vs. Frequency



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### **Product Storage**

To maximize product quality, this product should be stored in its original packaging in a –30 °C to –40 °C freezer.

Safety Data Sheets (SDS) and Application Note for the ALT-304 series are available in multiple languages. Please email Arieica at [partner@Arieica.com](mailto:partner@Arieica.com) to obtain a copy.

### **Warranty**

The information and data contained herein are believed to be accurate and reliable; however, this product is still under engineering validation. Quantities may be limited, and design specifications may change while we ready the product for release to production. This product is currently provided for proof of concept (PoC) evaluation, and Arieica makes no warranties concerning the fitness or suitability of its products for a particular use or purpose.