

ALPHA[®] HiTech CU21-3240

Underfill Epoxy

DESCRIPTION

ALPHA HiTech CU21-3240 is a one-component capillary underfill designed for the protection of assembled chip packages onto printed circuit boards. It is a high Tg & low CTE underfill with excellent reliability. It also has a good thermal cycling performance because of its low Coefficient of Thermal Expansion.


READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES AND BENEFITS

The balanced set of features and benefits for this material are:

- High Glass Transition Temperature (Tg)
- Low Coefficient of Thermal Expansion (CTE)
- Excellent Thermal Cycling performance
- Halogen-Free
- Complies with RoHS Directive 2015/863/EU

APPLICATION GUIDELINES

Storage	Thawing	Application	Curing
1. Freeze at ≤ -20 °C to guarantee product stability. 2. Upright Position, tip facing bottom. 	1. Remove the syringe from the freezer. 2. Set aside at room temperature for 2 hours. 3. Do not open the cap before the product is sufficiently thawed. 4. Product should not be refrozen after thawed. 5. To prevent contamination of unused products, do not return any material to its original container.	For fast and effective flow of ALPHA HiTech CU21-3240 beneath the component, temperatures between 70 to 100 °C can be applied to the substrate.	For full property development, cure at the following conditions in a convection oven. <ul style="list-style-type: none"> • 140 °C for ≥ 30 minutes • 150 °C for ≥ 10 minutes • 165 °C for ≥ 5 minutes

TECHNICAL DATA

Category	Specification
Typical Uncured Material Properties	
Appearance	Black
Viscosity, cps (RVT Brookfield Spindle #5, 20rpm @25 °C)	15,540
Filler Content (SiO ₂), %	50
Average Filler Size, μm	3
Maximum Filler Size, μm	25
Specific Gravity	1.5 to 1.6
Pot Life @ 25 °C, days	3
Shelf Life @ ≤ -20 °C, months	6
Available Packaging	10 cc, 30 cc, 50 cc, 55 cc syringes

*Note: The values on the table are intended as a reference. It is not an absolute value.

Category	Specification
Typical Cured Materials Properties	
Glass Transition (T _g), °C via TMA	165 ± 5
CTE (α ₁), <T _g , ppm	31 ± 10
CTE (α ₂), >T _g , ppm	105 ± 20
Hardness (Shore D)	85 to 95
Modulus, Mpa (via DMA @ 0 to 200 °C)	5,508
Linear Shrinkage, %	0.86
Volume Shrinkage, %	1.57
Coefficient of Thermal Conductivity, W/mK	0.745
Halogens, ppm (per 3rd Party Lab testing)	Br: Not Detected
	Cl: 305
	F: 0.02
Extractable Ionic Content - Anion, ppm	Cl: 0.47
	Total: 0.48
	K ⁺ : 0.25
Extractable Ionic Content - Cation, ppm	Na ⁺ : 1.47
	Total: 1.72
Reworkable	No
Water Absorption, %	25 °C for 24 hrs: 0.17
	100 °C for 2 hrs: 0.42
DSC Compatibility Test with Flux Residue	ALPHA CVP-390: Pass
	ALPHA OM-340: Pass
	ALPHA OM-353: Pass
	ALPHA OM-358: Pass

Category	Specification
Typical Cured Material Properties	
SIR per IPC J-STD-0004B TM-650 Method 2.6.3.7 (40 °C, 90 %RH, 12V bias)	ALPHA CU21-3240: Pass
	ALPHA HiTech CU21-3240 + ALPHA CVP-390: Pass
	ALPHA HiTech CU21-3240 + ALPHA OM-340: Pass
	ALPHA HiTech CU21-3240 + ALPHA OM-353: Pass
	ALPHA HiTech CU21-3240 + ALPHA OM-358: Pass
Thermal Shock (Air to Air) @ -40 to 125 °C / Dwell 30 min / cycle (Alloy: SAC305)	Pass up to 5,000 Cycles
Surface Resistivity, Ω/cm^2 (ASTM D257)	3.6×10^{15}
Volume Resistivity, $\Omega.\text{cm}$ (ASTM D257)	2.5×10^{16}
Dielectric Breakdown Voltage, kV (ASTM D149)	54
Dielectric Breakdown Strength, kV/mm (ASTM D149)	21
Dielectric Constant (Low Frequency – 1 KHz & 1 MHz: ASTM D150; High Frequency – 1 GHz & 2 GHz: IPC TM 650 2.5.5.9)	1 KHz: 4.67
	1 MHz: 4.49
	1 GHz: 3.27
	2 GHz: 3.25
Dissipation Constant (Low Frequency – 1 KHz & 1 MHz: ASTM D150; High Frequency – 1 GHz & 2 GHz: IPC TM 650 2.5.5.9)	1 KHz: 0.0005
	1 MHz: 0.0048
	1 GHz: 0.0150
	2 GHz: 0.0220

SAFETY & WARNING

It is recommended that the company/operator read and review the Safety Data Sheets for the appropriate health and safety warnings before use. **Safety Data Sheets are available at MacdermidAlpha.com/assembly-solutions/knowledge-base.**

CONTACT INFORMATION

To confirm this document is the most recent version, please contact
Assembly@MacDermidAlpha.com
www.macdermidalpha.com

<p>North America 109 Corporate Blvd. South Plainfield, NJ 07080, USA 1.800.367.5460</p>	<p>Europe Unit 2, Genesis Business Park Albert Drive Woking, Surrey, GU21 5RW, UK 44.01483.758400</p>	<p>Asia 8/F., Paul Y. Centre 51 Hung To Road Kwun Tong, Kowloon, Hong Kong 852.3190.3100</p>
---	--	---

Also read carefully warning and safety information on the Safety Data Sheet. This data sheet contains technical information required for safe and economical operation of this product. READ IT THOROUGHLY PRIOR TO PRODUCT USE . Emergency safety directory assistance: US 1 202 464 2554, Europe + 44 1235 239 670, Asia + 65 3158 1074, Brazil 0800 707 7022 and 0800 172 020, Mexico 01800 002 1400 and (55) 5559 1588

DISCLAIMER: All statements, technical information and recommendations contained herein are based on tests we believe to be reliable, but the accuracy or completeness thereof is not guaranteed. No statement or recommendation shall constitute a representation unless set forth in an agreement signed by officers of seller and manufacturer. NO WARRANTY OF MERCHANTABILITY, WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY IS MADE. The following warranty is made in lieu of such warranties and all other warranties, express, implied, or statutory. Products are warranted to be free from defects in material and workmanship at the time sold. The sole obligation of seller and manufacturer under this warranty shall be to replace any noncompliant product at the time sold. Under no circumstances shall manufacturer or seller be liable for any loss, damage or expense, direct, indirect, incidental or consequential, arising out of the inability to use the product. Notwithstanding the foregoing, if products are supplied in response to a customer request that specifies operating parameters beyond those stated above, or if products are used under conditions exceeding said parameters, the customer by acceptance or use thereof assumes all risk of product failure and of all direct, indirect, incidental and consequential damages that may result from use of the products under such conditions, and agrees to exonerate, indemnify, defend and hold harmless MacDermid, Incorporated and its affiliates therefrom. No suggestion for product use nor anything contained herein shall be construed as a recommendation to use any product in a manner that infringes any patent or other intellectual property rights, and seller and manufacturer assume no responsibility or liability for any such infringement.

© 2019 MacDermid, Inc. and its group of companies. All rights reserved. "(R)" and "TM" are registered trademarks or trademarks of MacDermid, Inc. and its group of companies in the United States and/or other countries.