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. • 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 (SiO2), %	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 (Tg), °C via TMA	165 ± 5
CTE (α_1), <Tg, ppm	31 ± 10
CTE (α_2), >Tg, 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
Extractable Ionic Content - Anion, ppm	F^-: 0.02
	Cl^-: 0.47
	Total: 0.48
Extractable Ionic Content - Cation, ppm	K^+: 0.25
	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/cm2 (ASTM D257)	3.6×10^{15}
Volume Resistivity, Ω.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.**

CONTACT INFORMATION

www.macdermidalpha.com

North America	**Europe**	**Asia**
140 Centennial Avenue Piscataway, NJ 08854 1.800.367.5460	Unit 2, Genesis Business Park Albert Drive Woking, Surrey, GU21 5RW, UK 44.01483.758400	8/F., Two Sky Parc 51 Hung To Road Kwun Tong, Kowloon, Hong Kong, SAR China 852.2500.5365

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