ALPHA® HiTech CF31-4010

Edgebond Epoxy

DESCRIPTION

ALPHA HiTech CF31-4010 is a one component, high filler content, heat curable edgebond. It is an epoxy-based material to be dispensed on the corner (corner bonding) or edges (edge bonding) of BGA devices. Upon completion of the curing process, the cured edgebond helps to strengthen the soldered assembled component allowing it to pass reliability tests such as Drop Shock, Impact Bend and Thermal Cycle (TCT).

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 product, do not return any material to its original container.	ALPHA HiTech CF31-4010 can be effectively dispensed at room temperature condition.	For full property development, cure at the following conditions in a convection oven. • 120 °C for ≥ 30 minutes • 130 °C for ≥ 10 minutes • 150 °C for ≥ 7 minutes

TECHNICAL DATA

Category	Specification
Typical Uncured Material Properties	
Appearance	White
Viscosity (Malcom PC-10A, 30 rpm @ 25 °C, cP)	*12,000 to 22,000
Thixotropic Index (3 rpm / 30 rpm)	1.0 to 3.0
Filler Content (SiO_2), %	62
Average Filler Size, µm	3
Maximum Filler Size, µm	25
Specific Gravity	1.5 to 1.7
Pot Life @ 25 °C, day	3
Shelf Life @ ≤ -20 °C, month	6
Available Packaging	10 cc, 30 cc syringes

*Note: Values are tentative until specification limits have been established and finalized.

Category	Specification
Typical Cured Materials Properties	
Glass Transition (Tg), °C via TMA	170 ± 5
CTE (α_1), <Tg, ppm	25 ± 10
CTE (α_2), >Tg, ppm	70 ± 20
Hardness (Shore D)	80 to 90
Modulus, Mpa (via DMA)	5,500 ± 1,000
Linear Shrinkage, %	≤ 0.5
Coefficient of Thermal Conductivity, W/mK	≤ 1.0
Halogens, ppm (per 3rd Party Lab testing)	Not Detected
Extractable Ionic Content - Anion, ppm	F^-: 7.1
	Cl^-: 0.3
	Total: 7.4
Extractable Ionic Content - Cation, ppm	Na^+: 2.6
	Total: 2.6
Water Absorption, %	25 °C for 24 hrs: ≤0.5
	100 °C for 2 hrs: ≤0.5
DSC Compatibility Test with Flux Residue	ALPHA CVP-390: Pass
	ALPHA OM-353: Pass
DSC Compatibility Test with Flux Residue	ALPHA OM-358: Pass
	ALPHA OM-340: Pass
	ALPHA OM-550: Pass

Category	Typical Values
Typical Cured Material Properties	
SIR per IPC J-STD-0004B IPC-TM-650 Method 2.6.3.7 (40 °C, 90 %RH, 12 V bias)	ALPHA HiTech CF31-4010: Pass
	ALPHA HiTech CF31-4010 + ALPHA CVP-390: Pass
	ALPHA HiTech CF31-4010 + ALPHA OM-340: Pass
	ALPHA HiTech CF31-4010 + ALPHA OM-353: Pass
	ALPHA HiTech CF31-4010 + ALPHA OM-358: Pass
Insulation Resistance, Ω (72 hrs, 85 °C / 85 %RH)	≥ 1.0 X 10^{12}
Thermal Shock (Air to Air) @ -40 to 125 °C / Dwell 30 min / cycle (Alloy: SAC305)	Pass up to 2,700 Cycles
TCT @ -40 to 150 °C / Dwell 30 min / cycle (Alloy: Innolot), as per IPC 9701A	Edgebond: Pass up to 3,000 Cycles Cornerbond: Pass up to 2,000 Cycles
Surface Resistivity, Ω/cm^2 (ASTM D257)	2.4 x 10^{16}
Volume Resistivity, Ω.cm (ASTM D257)	4.1 x 10^{16}
Dielectric Breakdown Voltage, kV (ASTM D149)	43
Dielectric Breakdown Strength, kV/mm (ASTM D149)	25
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: 4.82
	1 MHz: 4.34
	1 GHz: 3.28
	2 GHz: 3.28
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: 0.0038
	1 MHz: 0.0062
	1 GHz: 0.121
	2 GHz: 0.0196

SAFETY

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

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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