MacDermid Alpha ELECTRONICS SOLUTIONS

TECHNICAL DATA SHEET

ALPHA® HiTech® CF31-4026

Next-Generation High Reliability, Reworkable Edgebond

DESCRIPTION

ALPHA HiTech CF31-4026 is a one-component, halogen-free, reworkable edgebond epoxy system that combines high glass transition temperature (Tg) and low coefficient of thermal expansion (CTE) to maximize thermal cycling performance in harsh operating conditions.

ALPHA HiTech CF31-4026 is highly reworkable at temperatures as low as 185 ℃ while offering excellent adhesion strength. The reworkable nature of the edgebond enables high manufacturing yields and reduced wastage, supporting organizations in meeting their sustainability goals. **ALPHA HiTech CF31-4026** provides a unique balance of mechanical rigidity and reworkability to the assembly process.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES & BENEFITS

- Excellent adhesion on FR4 board, providing mechanical strength to the assembly.
- Material is easily reworkable using hot air at temperatures as low as 185 °C, providing cost savings for customers.
- Superior balance of Tg and CTE to enable board-level reliability at high operating temperatures.
- Non-slump performance prevents material from contacting solder interconnects beneath components.
- Superior thermal cycling performance compared to baseline assembly configurations, such as SAC305.
- Fluorescent appearance, enabling easier visual inspection for quality under UV light.
- Halogen-free; no bromine (Br) or chlorine (Cl) intentionally added.
- Complies with RoHS Directive EU/2015/863; amending Annex II to 2011/65/EU.

TECHNICAL DATA

Category	Specification
Typical Uncured Material Properties	
Appearance	Black & Fluorescent
Viscosity, cps (Malcom PC-10A, 30 rpm @ 25 °C)	110,000 ± 30,000
Thixotropic Index (3 rpm / 30 rpm)	2.5 ± 1.0

Category	Specification
Specific Gravity (Solid)	1.7 ± 1.0
Pot Life @ 25 °C, days	5
Shelf Life @ ≤ -20 °C, months	6
Available Packaging*	10 cc, 30 cc, 55 cc

*Please contact your local sales representative for other packaging configurations.

*Note: The values on the table are intended as a reference. They are not absolute values.

Category	Typical Values	
Typical Cured Materials Properties		
Glass Transition (Tg), °C via TMA	126	
CTE (α_1), <Tg, ppm	28	
CTE (α_2), >Tg, ppm	91	
Hardness (Shore D)	D 90	
Modulus, Mpa (via DMA @ 25 °C)	8,000	
Halogens, ppm (per 3rd Party Lab testing)	Br	Not Detected
	Cl	Not Detected
	F	282
Extractable Ionic Content - Anion, ppm	NO_3^-	Not Detected
	SO_4^{2-}	Not Detected
Extractable Ionic Content - Cation, ppm	Na^+	Not Detected
	K^+	Not Detected
Moisture Absorption (85 °C 85% RH, 168 hour), %	<2.0	
SIR per IPC J-STD-0004C (85 °C, 85% RH, 12.5 V bias)	ALPHA HiTech CF31-4026	PASS, ≥ 1 x 10^8 Ohms for 7 days
	ALPHA HiTech CF31-4026 + ALPHA OM-353	PASS, ≥ 1 x 10^8 Ohms for 7 days
Thermal cycling, -40 °C (30 minutes) to 125 °C (30 minutes) (Alloy: SAC305)	2,000 cycles	PASS

Category	Typical Values	
Reworkability (Hot Air, @ 185 °C to 250 °C)	Reworkable	
Resistivity (ASTM D257)	Surface, Ω/cm^2	3 x 10^{16}
	Volume, Ω.cm	6 x 10^{15}
Dielectric Breakdown Voltage, kV (ASTM D149)	46	
Dielectric Breakdown Strength, kV (ASTM D149)	24	
Dielectric Constant	100 kHz	4.2
	1 MHz	4.02
	1 GHz	3.21
	2 GHz	3.19
Dissipation Constant	100 kHz	0.0061
	1 MHz	0.0088
	1 GHz	0.0142
	2 GHz	0.0243

*Note: The values on the table are intended as a reference. They are not absolute values.

PROCESSING GUIDELINES

Storage

1. Store at ≤ -20 °C to maintain product stability.
2. Store in an upright position, with the tip facing downward.



Thawing

1. Remove the syringe from the freezer.
2. Allow it to rest at room temperature for 2 hours.
3. Do not open the cap until the product has fully thawed.

Caution:

1. Do not refreeze thawed product.
2. To prevent contamination of unused product, do not return any material to its original container.

Dispensing

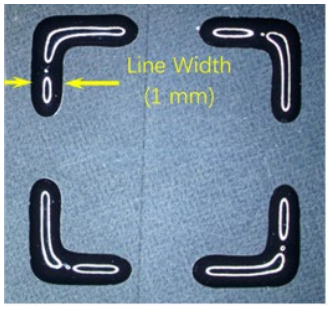
ALPHA HiTech CF31-4026 can be effectively dispensed at room temperature.

A tapered needle is recommended for dispensing.

Dispensing Type	Nozzle Gauge	Pressure		Speed	Temperature, °C
		kPa	PSI		
Time-Pressure	Tapered 2G	500	72.5	1 mm/s	Ambient
	Tapered 12G	175	25.4	7 mm/s	Ambient

Dispensing Type	Nozzle Gauge	Pressure		Rotation Speed	Temperature, °C
		kPa	PSI		
Auger Screw	Straight 21G	207	30	150 RPM	Ambient

Dispensing Type	Orifice	Pressure		On Time, msec	Temperature, °C
		kPa	PSI		
Jetting	150 µm	276	40	1.5	50



The starting parameters are suitable for dispensing a 1 mm line width, as pictured above.

Curing

Curing condition: (Using convection oven)

- ≥ 10 minutes @ 130 °C
- ≥ 15 minutes @ 120 °C
- ≥ 5 minutes @ 150 °C

* It is advised to reach the curing temperature within 3 minutes. If needed, pre-heat the oven to achieve the curing temperature within 3 minutes.

The recommendations above are offered as a process window guideline based on a typical assembly process. Optimal process settings should be evaluated for each specific process due to variations in assembly practices across the electronics industry.

Please contact MacDermid Alpha technical representatives for further process / application support.

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

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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

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