

ALPHA[®] HITECH[®] CU31-3300

Next-Generation 2nd Level High Reliability, Reworkable Underfill

DESCRIPTION

ALPHA HiTech CU31-3300 is a one-component reworkable underfill with the optimal balance combining moderately high glass transition temperature (Tg) with excellent reworkability. **ALPHA HiTech CU31-3300** is easily removable without damaging the solder mask. It has superior pot life of 20 days at room temperature, and a mild storage condition of 1 to 10 °C. The reworkability of the underfill enables lower total cost of ownership, supporting organizations towards meeting sustainability goals. **ALPHA HiTech CU31-3300** has demonstrated its strong thermomechanical reliability performance as it passed thermal cycling test of -40 to 105 °C for at least up to 1,000 cycles.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES & BENEFITS

- Moderately high Tg of 111 °C enables various application ranging from mobile to wearables, computing and automotive.
- Long pot life of 20 days enables more stable processing window as material stays usable for longer period.
- Proven thermomechanical reliability performance as it passed TCT of -40 to 105 °C at least up to 1,000 cycles.
- Easily reworkable without causing damage on solder mask.
- Good adhesion strength, reinforcing critical BGA components to enhance board-level reliability.
- Halogen-Free; no halogens 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	White
Viscosity, cps (Brookfield RVT, 20 rpm @ 25 °C)	2,800 ± 600
Specific Gravity	1.1 to 1.2
Pot Life @ 25 °C, days	20

Category	Specification
Shelf Life @ 1 to 10 °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 value.

Category		Typical Values	
Typical Cured Materials Properties			
Glass Transition (Tg), °C via TMA		111	
CTE (α ₁), <Tg, ppm/°C		62	
CTE (α ₂), >Tg, ppm/°C		212	
Hardness (Shore D)		D77	
Modulus, MPa (via DMA @ 25 °C)		2,502	
Elongation, %		10.1	
Water Absorption, %, 24 hours @ 25 °C		0.38	
Adhesion Strength, Kgf, FR4 + 2012 chip		11.7	
Reworkability (Hot Air, @ 300 to 350 °C)		Reworkable	
Thermal Cycling Test (Test Condition: -40 to 105 °C, Dwell: 30 mins)		CVP-390V + CU31-3300	1,450 cycles
Drop Shock, times Shock G: 1,500 (Alloy: SAC 305), BGA 84	SAC 305	1,292	Baseline
	SAC 305 + CU31-3300	4,305	Increase 233%
Halogens, ppm (per 3rd Party Lab testing) Br Cl F I		Not Detected 535 Not Detected Not Detected	
Surface Resistivity (ASTM D257), Ω/cm ²		8 x 10 ¹⁴	
Volume Resistivity (ASTM D257), Ω.cm		4 x 10 ¹⁵	
Electrical Conductivity, S/cm		4 x 10 ⁻¹⁶	
Dielectric Constant 100 kHz		4.93	

Category	Typical Values
1MHz	4.77
1GHz	2.91
2GHz	2.89
Dissipation Factor	
100 kHz	0.0069
1MHz	0.0073
1GHz	0.0181
2GHz	0.0155
Dielectric Breakdown Voltage (ASTM D149), kV	52
Dielectric Breakdown Strength (ASTM D149), kV/mm	25

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

PROCESSING GUIDELINES

Storage

1. Stored at 1 to 10 °C to maintain product stability.
2. Upright position, tip facing bottom.



Thawing

1. Take the syringe out from the refrigerator.
2. Set aside at room temperature for 2 hours.
3. Do not open the cap before a product is fully thawed.

Caution:

1. Do not storage the thawed product into refrigerator.
2. To prevent contamination of unused products, do not return any material to its original container.

Dispensing

ALPHA HiTech CU31-3300 can be effectively dispensed at room temperature.

Dispensing Type	Nozzle Gauge	Pressure		Speed, mm/s	Temperature, °C
		kPa	psi		
Time-Pressure	21G	70	10	10	Ambient

Dispensing Type	Nozzle Gauge	Pressure		Rotation Speed, RPM	Temperature, °C
		kPa	psi		
Auger Screw	21G	500	5	180	Ambient

Dispensing Type	Nozzle Gauge	Pressure		On Time, msec	Temperature, °C
		kPa	psi		
Jetting	100µm	14	2	2.0	Ambient

Curing

Curing condition: (Using convection oven)

- > 15 minutes @ 120 °C
- ≥ 7 minutes @ 135 °C
- > 5 minutes @ 150 °C

The recommendations above are offered as a process window guideline based on typical assembly process. The optimum process setting will need to be assessed for each individual process due to the variation in assembly processes 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

www.macdermidalpha.com

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