

# ALPHA<sup>®</sup> OM-220 Solder Paste

## Ultra-Low Temperature Soldering (ULTS) Solution

### DESCRIPTION

**ALPHA OM-220** is a new, ultra-low temperature solder paste paired with Alpha's **ULT1** alloy intended for soldering temperature sensitive components and substrates. This innovative chemistry enables peak reflow temperatures below 150 °C, making it ideal for soldering of heat sensitive components and sub-assemblies. In addition, **ALPHA OM-220** permits cascaded / hierarchical soldering, as well as novel hermetic sealing solutions. Its halogen and halide-free formulation complies with industrial standards without compromising on soldering performance.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

### FEATURES AND BENEFITS

- Low reflow peak temperature <150 °C
- Reduction of warpage (component and substrate) vs SAC process
- Excellent printing performance
- Minimal and clear colorless residue
- Excellent electrical reliability; passes JIS Z 3197 & J-STD-004B SIR testing
- Exhibits low voiding characteristics; passes IPC-7095 Class 3 voiding on BGA components
- Provides efficiencies in both energy and cost
- Halide-free and zero-halogen compliant

### PRODUCT INFORMATION

<u>Alloy:</u>	ULT1
<u>Powder Size:</u>	Type 3P
<u>Packaging Size:</u>	500-gram jar
<u>Lead-Free:</u>	Complies with RoHS Directive EU/2015/863
<u>Halogen Content:</u>	Zero-halogen

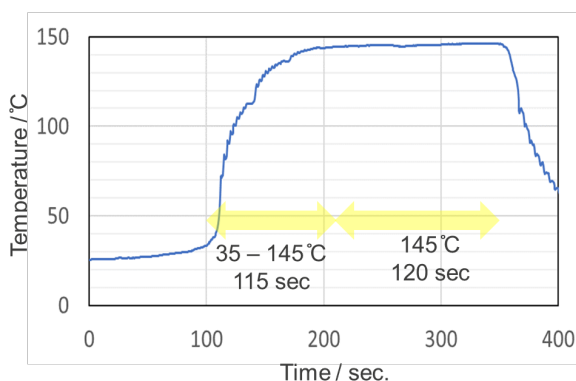
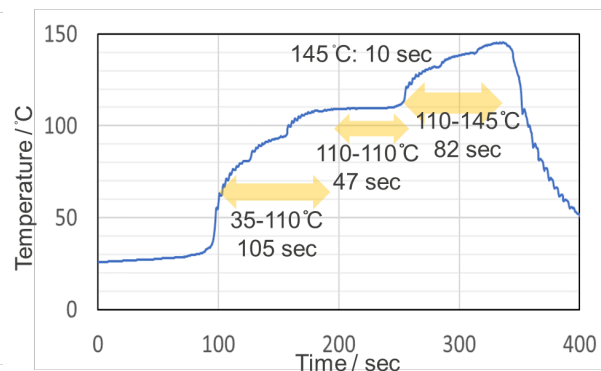
**APPLICATION GUIDELINES**
**Printing**

- **STENCIL:** Recommend ALPHA CUT or ALPHA FORM stencils at 0.100 to 0.125 mm (4 to 5 mil) thick for 0.4 mm (16 mil) pitch. Stencil design is subject to many process variables. Contact your local Alpha sales site for advice.
- **SQUEEGEE:** Metal (recommended)
- **PASTE ROLL:** 1.5 to 2.0 cm (0.6 to 0.8 in) diameter and make additions when roll reaches 1.0 cm (0.4 in) diameter
- **PRESSURE:** 0.2 N/mm<sup>2</sup> (29.0 lb/in<sup>2</sup>) successfully tested
- **SPEED:** 50.0 mm/s (2.0 in/s)
- **RELEASE SPEED:** 10.0 mm/s (0.4 in/s) successfully tested
- **LIFT HEIGHT:** 2.0 mm (0.08 in)
- **DEPOSIT TO SPHERE RATIO:** 0.4 to 0.60 recommended

**Reflow**

- **ATMOSPHERE:** Nitrogen (N<sub>2</sub>) required
- **PROFILE (ULT1 alloy):** The following settings have been determined to give optimal result, but other settings give excellent results as well.
  - Slope: 35 to 145 °C (95 to 293 °F), 0.96 °C/s (1.73 °F/s)
  - TAL: >131 °C (>268°F) - 209 seconds
  - Peak: 145 °C (293 °F)

Recommended Profiles:

**HAT PROFILE:**

**SOAK PROFILE:**


NOTE: Reflow profiles suggested above represent single exposure to achieve optimized joint. Please consult your local Alpha sales representative for assemblies requiring more than a single reflow exposure.

### Cleaning

ALPHA OM-220 residues are designed to remain on the board after reflow. Misprints and stencil cleaning may be done with ALPHA SM-110 cleaner.

### TECHNICAL DATA

Category	Results	Procedure/Remarks
<b>Chemical Properties</b>		
Activity Level	ROL0	IPC J-STD-004B
Halide Content	<500 ppm	IPC J-STD-004B
Fluoride Spot Test	No fluoride detected	IPC J-STD-004B
Halogen Test	None detected per 3rd party testing	Zero-halogen
Ag Chromate Test	No chloride and bromide detected	IPC J-STD-004B
Copper Mirror Test	No evidence of mirror breakthrough	IPC J-STD-004B
Copper Corrosion Test	No evidence of corrosion	IPC J-STD-004B
	No evidence of corrosion	JIS Z 3197
<b>Electrical Properties</b>		
Surface Insulation Resistance	>1.0 x 10 <sup>10</sup> Ω	JIS Z 3197
	>1.0 x 10 <sup>9</sup> Ω	IPC J-STD-004B

Category	Results	Procedure/Remarks
<b>Physical Properties</b>		
Color	Clear, colorless flux residue	
Tack Force vs. Humidity	<105 gf from initial to 24hrs	JIS Z 3284-3:2012
	Stable until 8 hrs	IPC J-STD-005
Solder Ball	Acceptable	IPC J-STD-005
Spread	Mean spread ratio for is 83.26%	JIS Z 3197
Cold Slump	No bridges at 0.3mm	JIS Z 3197
	No bridges at largest gap acceptable	IPC J-STD-005
Hot Slump	No bridges at 0.4mm	JIS Z 3197
	No bridges at largest gap acceptable	IPC J-STD-005
Dryness Test (Talc)	Residue is not sticky 1 hour after reflow	JIS Z 3197

**RECYCLING SERVICES**

We provide safe and efficient recycling services to help companies meet their environmental and legislative requirements and at the same time, maximize the value of their waste streams.

Our service collects solder dross, solder scrap, and various forms of solder paste waste. Please contact your local sales representative for recycling capabilities in your area or [link here](#).



**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](http://MacDermidAlpha.com/assembly-solutions/knowledge-base).**

**STORAGE**

ALPHA OM-220 should be stored in a refrigerator upon receipt at 0 to 10 °C (32 to 50 °F). The paste should be permitted to reach room temperature for at least 4 hours before unsealing its package prior to use and can be stored for 2 weeks at room temperature up to 25 °C (77 °F) prior to use. Paste must be ≥ 19 °C (66 °F) before processing. Verify paste temperature with a thermometer to ensure paste is at 19 °C (66 °F) or greater before setup.

Do not remove worked paste from stencil and mix with unused paste in jar. This will alter the rheology of the unused paste. These are starting recommendations and all process settings should be reviewed independently. SHELF LIFE: 6 months refrigerated

**CONTACT INFORMATION**

To confirm this document is the most recent version, please contact  
**Assembly@MacDermidAlpha.com**  
[www.macdermidalpha.com](http://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

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