

# ALPHA<sup>®</sup> UP-78 NO-CLEAN SOLDER PASTE

## Maximum ATE Performance

### DESCRIPTION

**ALPHA UP-78** is a no-clean solder paste with a post-reflow residue that is clear and colorless and is penetrable enough to allow easy ATE compatibility (pin testability). The residue is engineered to be soft and non-tacky to allow the lowest level of false rejects during pin testing.

**ALPHA UP-78** is designed for stencil application and air reflow in surface mounting processes where post reflow cleaning is not required.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

### FEATURES AND BENEFITS

- Long stencil life & stable tack for minimum change in performance over 8 hour shifts under varying humidity exposure.
- Tolerant to a variety of reflow profiles for easy reflow on varying board designs.
- Highly penetrable residue to allow easy ATE compatibility (pin testing) and minimal false fails.
- Clear and colorless residue after reflow for the best board cosmetics.

### PRODUCT INFORMATION

<u>Alloy:</u>	63Sn/37Pb, 62Sn/36Pb/2Ag, 42Sn/58Bi*
<u>Rheology:</u>	Stencil printing
<u>Metal Percentage:</u>	89%
<u>Powder Size:</u>	Type #3 (per IPC J-STD-005)
<u>Packaging Sizes:</u>	500 gram jar and 6 inch, 12 inch cartridges

\* Note: ALPHA UP-78 in Sn42/Bi58 performance is different than in Sn/Pb applications and requires customer validation of appropriateness for use in their application.

**APPLICATION GUIDELINES**

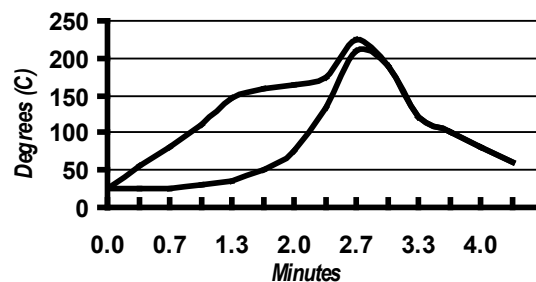
Formulated for standard and fine pitch printing through stencil apertures as small as 0.008 inches (0.2 mm). Crisp, well defined print definitions are repeatably attainable on 0.016 inch (0.4 mm) pitch pads with type 3 powder.

**TECHNICAL DATA**

Category	Results	Procedure/Remarks
Fluxing Ability	Reflowed Solder Paste, Hot Solder Dip, Tin Plate, Tin Hot Dip, Silver Plate, Copper, Gold, Ag/Pd Plate, Cu Protective Coatings	Fluxing ability on tarnished surfaces
<b>Chemical Properties</b>		
Corrosivity	Copper Mirror Test (L)	IPC J-STD-004
Halide Content	Silver Chromate Paper Test (pass)	CLASSIFICATION: <b>ROL-1</b>
<b>Electrical Properties</b>		
SIR (IPC J-STD-004)	All Readings > 1.0 x 10E9 ohms	Pass, 7 days, uncleaned
SIR (Bellcore TR-NWT-000078)	All Readings > 1.0 x 10E13 ohms	Pass, 4 days, uncleaned
<b>Physical Properties</b>		
Color and Specific Gravity	Clear, Colorless; 4.9g/cc	
Reflowed Residue	~ 5.5% ww, tack free after reflow	
Tack Force	> 2.4 g/mm <sup>2</sup> @ 6 hours (72%RH, 25 °C)	J-STD-005
Viscosity	Designated M-13. Viscosity is suitable for all typical stencil printing applications.	Malcom Spiral Viscometer; ICP-029
Stencil Life	> 6 hours	50%RH, 25 °C
Slump	Suitable for fine pitch printing	IPC TM-650
ATE Compatibility (Pin Testability)	24 grams (<1.0 ounce) on 11.5 mil thick flux deposit	Force to Contact Test (30° spear geometry)

**PROCESSING GUIDELINES**

Printing	Reflow (See Figure #1)	Cleaning
<p><b>Stencil:</b> Recommend ALPHA laser cut stencil @ 0.006 inch thick for 0.020 inch pitch (0.008 inch thick for 0.025 inch pitch) or Alpha manufactured chemically etched stencil.</p> <p><b>Squeegee:</b> Recommend metal or 90 durometer polyurethane.</p> <p><b>Pressure:</b> 1pound per linear inch of print pattern.</p> <p><b>Downstop:</b> -0.075 inch</p> <p><b>Stencil Separation:</b> 0.002 inch/sec</p> <p><b>Squeegee Speed:</b> 0.5 to 2.0 inch (15 to 50 mm) per second</p> <p><b>Paste Roll:</b> 0.4 to 0.6 inches (1 to 1.5 cm) diameter and make additions when roll reaches 0.2 inch (0.5cm) diameter.</p>	<ul style="list-style-type: none"> <li>Use convection, IR, or combination ovens, belt, hot - plate, vapor phase.</li> <li>Clean-dry air or nitrogen atmosphere.</li> </ul> <p><b>Profile:</b> Straight ramp (60 to 120 °C/min to 220 °C ± 15 °C peak, TA 30 to 60 sec.) recommended as a starting point unless soak required for high density assemblies to reach thermal equilibrium. Suggested soak profile:</p> <ul style="list-style-type: none"> <li>Ramp @ 60 to 120 °C/min. to 120 to 160 °C.</li> <li>Dwell @ 120 to 160 °C for 1.0 to 1.5 minutes.</li> <li>Ramp @ 60 to 120 °C/min to 215 to 220 °C peak temp. Time over 183 °C for 30 to 60 seconds</li> <li>Ramp down to R.T. @ 90 to 120 °C/min.</li> <li>Ensure solder is frozen at exit of last heated zone to avoid disturbed joint defects.</li> </ul>	<p>Although designed as a no-clean flux system, the residue may be cleaned with:</p> <ul style="list-style-type: none"> <li>10% ALPHA 2110 saponifier with water.</li> <li>Water washing will not turn residues cloudy.</li> <li>Clean stencils with ALPHA SC-10 stencil cleaner</li> </ul>

**REFLOW PROFILES**
**Figure 1: Reflow Profile Envelope**


**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**

Refrigerate to guarantee stability @32 to 50 °F (0 to 10 °C); Shelf life of refrigerated paste is six months. Warm-up of paste container to room temperature should be ~ 6 hours. Set up printer with room temperature paste. Check paste temperature with a thermometer. Do not remove worked paste from stencil and mix with unused paste in jar. This will alter rheology of unused paste.

**CONTACT INFORMATION**

**To confirm this document is the most recent version, please contact  
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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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