

# ALPHA<sup>®</sup> UP78-T Solder Paste

No-Clean Solder Paste (9098T)

## DESCRIPTION

**ALPHA UP78-T** is a low residue, no-clean solder paste designed to maximize SMT line yields. The flux vehicle is rheologically formulated to provide excellent fine pitch and high-speed printing properties. **ALPHA UP78-T** is designed for reflow in either air or nitrogen surface mount processes where post reflow cleaning is not required. The **ALPHA UP78-T** activation system has been optimized to reduce the incidence of non-soldered joints, while maintaining long term reliability. The clear, colorless residue is designed to spread from the joint, leaving the assembly suitable for some pin testing applications.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

## FEATURES AND BENEFITS

- Long stencil life and stable tack for minimum change in performance over 24 hours, at nominal 50% R.H. at 25 °C.
- Print speed up to 200mm/s.
- Wide reflow profile window with excellent solderability for easy reflow on varying board / component finishes.
- Thin spread 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/37.4Pb/0.4Ag/0.2Sb, 62Sn/36Pb/2Ag, 95.5Sn/3.8Ag/0.7Cu
<u>Rheology:</u>	Fine pitch stencil printing
<u>Residues:</u>	5.5% by weight
<u>Metal Percentage:</u>	90.0%
<u>Powder Size:</u>	Type 3, 25 to 45 µm (per IPC J-STD-005)
<u>Packaging Sizes:</u>	500 gram and 1kg jars and cartridges, DEK ProFlow cassettes

**APPLICATION GUIDELINES**

Formulated for standard and fine pitch printing through stencil apertures as small as 0.18 mm (0.3mm pitch) at a print speed of between 10mm/s and 200mm/s. ALPHA UP78-T is especially suitable for ultra fine pitch applications when used in conjunction with Alpha laser cut stencils. Minimum stencil aspect ratio should be 1.3:1 (minimum aperture width / stencil thickness) for sharp, well-defined print definitions. Suitable application methods include: Squeegee Printing, MPM RheoPump and DEK ProFlow.

**TECHNICAL DATA**

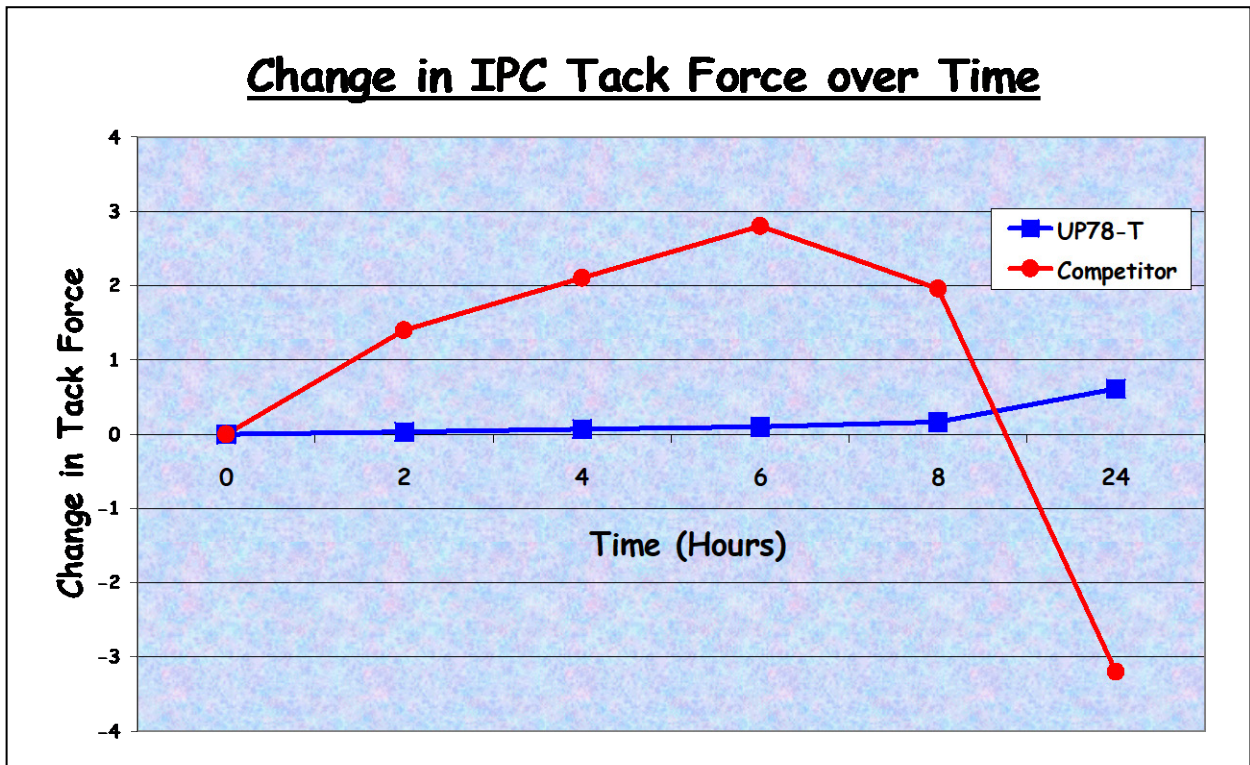
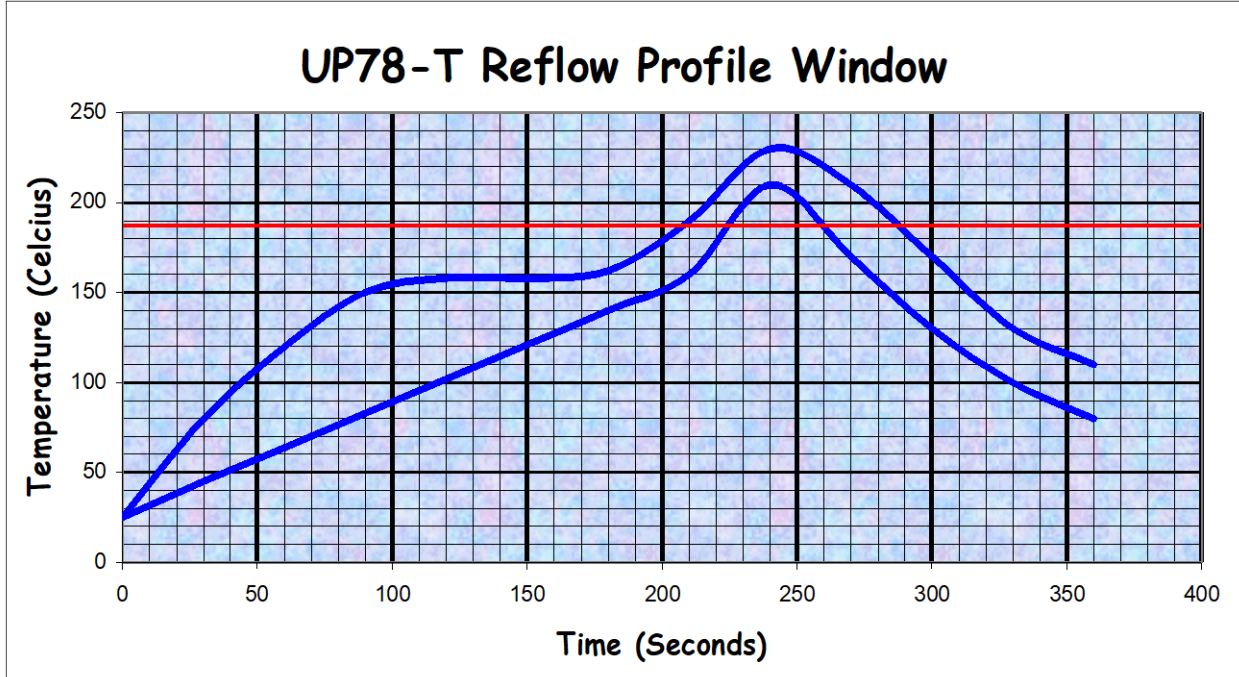
Category	Results	Procedures/Remarks
<b>Chemical Properties</b>		
Copper Plate Corrosion Test	Pass	Per JIS Z 3197
Corrosivity, Copper Mirror	Pass (L)	Per IPC TM-650, JIS Z 3197
Silver Chromate Paper Test	Pass (ROL 1)	Per IPC TM-650
Halide Content (Cl <sup>-</sup> )	0.04%	% Wt of paste
Surface Insulation Resistance J-Std 004	Pass - All Readings > $1.0 \times 10^9 \Omega$ Minimum Requirement = $1.0 \times 10^8 \Omega$	85 °C/85% RH. - 48V 168 Hours (Independent Lab Results)
Surface Insulation Resistance Bellcore GR-78-CORE	Pass - Average = $1 \times 10^{13} \Omega$ .	35 °C/85% RH. - 48V. (Independent Lab Results)
Electromigration Bellcore GR-78-CORE	Initial = $6.7 \times 10^9 \Omega$ , final = $2.9 \times 10^{10} \Omega$ .	65 °C/85% RH. 10V. Passed Electrical and visual requirements.
Voltage applied moisture Resistance	$1.96 \times 10^9 \Omega$ (paste flux) $1.14 \times 10^9 \Omega$ (Paste)	85 °C/85% RH at 10V DC, 1008 Hrs
Water Solution Resistance	>90,000 $\Omega$ .cm	JIS Z 3197
<b>Physical Properties</b>		
Thixotropic Index	0.74	JIS Z 3284
Paste Color and Specific Gravity	Grey - 4.9g/cc	
Reflowed Residue	Clear, colorless - tack free after reflow 5.5% w/w	
Tack Force	$1.8 \text{g/cm}^2$ 125 g.f @ 0hrs, 101 g.f @ 24Hrs	J-Std 005 JIS Z 3284

Category	Results	Procedures/Remarks
Viscosity	Viscosity is suitable for all typical stencil-printing applications.	Malcom Spiral Viscometer ICP-029
Stencil Life	> 24 hours	50%RH, 25 °C
Slump	Suitable for fine-pitch stencil printing. No bridging @ 200 micron gap	J-Std 005 JIS Z 3284

### PROCESSING GUIDELINES

Storage-Handling	Printing	Reflow	Cleaning (If Desired)
<ul style="list-style-type: none"> <li>Refrigerate to guarantee stability @ 0 to 10 °C (32 to 50 °F).</li> <li>Shelf life of refrigerated paste is six months.</li> <li>Warm-up of jar or cartridge to room temperature should be ~ 8 hours.</li> <li>Set up printer with room temperature paste. Check paste temperature with a thermometer.</li> <li>Do not remove worked paste from stencil and mix with unused paste in jar. This will alter the rheology of unused paste.</li> </ul>	<p><b><u>Stencil:</u></b> Recommend laser cut stainless steel stencil, or electroformed nickel</p> <p><b><u>Squeegee:</u></b> Recommend metal. &gt;90 durometer Polyurethane can also be used.</p> <p><b><u>Pressure:</u></b> 0.2 to 0.4kgs per linear cm of print pattern.</p> <p><b><u>Downstop:</u></b> 1.5 to 3.0mm</p> <p><b><u>Stencil Separation:</u></b> Slow</p> <p><b><u>Squeegee Speed:</u></b> 10 to 200mm per second</p> <p><b><u>Paste Roll:</u></b> 10 to 20mm 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><u>Profile:</u></b> Straight ramp (1 to 2 °C/sec to 220 °C peak, TAL 30 to 90 s) 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 @ 30 to 90 °C/min. to 120 to 160 °C.</li> <li>Dwell @ 120 to 160 °C for 1.0 to 1.5 minutes.</li> <li>Ramp @ 30 to 120 °C/min to 215 to 220 °C peak temp. Time over 183 °C for 30 to 90 seconds</li> <li>Ramp down to R.T. @ 60 to 150 °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>SC1080</li> <li>SC22 25% Solution</li> <li>SC30</li> <li>BIOACT EC-7</li> <li>BIOACT EC7-R 10% ALPHA 2110</li> </ul> <p>Stencils can be cleaned with ALPHA SC-10 stencil cleaner.</p>

REFLOW PROFILES



**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 UP78-T should be stored in a refrigerator upon receipt at 0 to 10 °C (32 to 50 °F). This will be sufficient to maintain a nominal shelf life of 6 months. ALPHA UP78-T should be permitted to reach room temperature before unsealing its package prior to use.

**CONTACT INFORMATION**

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

<p><b>North America</b>                  109 Corporate Blvd.                  South Plainfield, NJ 07080, USA                  1.800.367.5460</p>	<p><b>Europe</b>                  Unit 2, Genesis Business Park                  Albert Drive                  Woking, Surrey, GU21 5RW, UK                  44.01483.758400</p>	<p><b>Asia</b>                  8/F., Paul Y. Centre                  51 Hung To Road                  Kwun Tong, Kowloon, Hong Kong                  852.3190.3100</p>
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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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