

ALPHA[®] OM-355 SOLDER PASTE

Ultra-Low Voiding, Lowest Random Solder Ball, RoHs Compliant, Zero-Halogen Solder Paste designed for Vacuum Solder Reflow

DESCRIPTION

ALPHA OM-355 is a lead-free, zero-halogen, no-clean solder paste capable of air, nitrogen, and vacuum soldering reflow. In-line vacuum soldering capabilities are becoming more common as power density increases on BGA and bottom terminated component (BTC) packages require effective heat dissipation through void reduction. **ALPHA OM-355** solder paste activator system is optimized for the vacuum soldering reflow process to control the rate of volatilization and reduction in surface tension which allows voids to escape under reducing atmosphere. This promotes ultra-low voiding below 5% without the post-reflow defects commonly associated with vacuum soldering. **ALPHA OM-355** paste is compatible with SAC305, Innot, and Maxrel Plus.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES & BENEFITS

- **Designed for Vacuum Soldering Reflow:** Activator system optimized for vacuum solder conditions to ensure high quality soldering on complicated device packages
- **Ultra-Low Voiding Performance:** Improves heat dissipation as power densities increase on large area components such as BGA and BTC packages.
- **Excellent Random Solder Ball and Spatter Performance:** Addresses common vacuum soldering defects to minimize rework and improve first pass yield
- **Minimizes Solder Bridging defects:** Maintains electrical continuity post vacuum reflow on high density PCBs requiring large solder volume
- **Good Coalescence and Wetting Performance:** Coalesces down to 170 µm with 4 mil stencil exhibiting good wetting characteristics and solder joint reliability
- **Long, Stable Tack Force Life:** Promotes high pick-and-place yields and good self-alignment to minimize rework prior to reflow.
- **Good Electromigration characteristics:** Passes JIS Z 3197:1999, 8.3 to ensure electrical reliability & functionality
- **Zero-Halogen, No Halogens Intentionally Added:** Ensures ROHS compliance for a safe and environmentally friendly assembly process.

PRODUCT INFORMATION

<u>Alloys:</u>	SAC305, Innolot, Maxrel Plus Alloys For other alloys, contact your local Alpha Sales Office
<u>Powder Size:</u>	Type 4 & Type 5
<u>Packaging Sizes:</u>	500 gram jars
<u>Lead Free:</u>	RoHS Directive EU/2015/863; amending Annex II of 2011/65/EU.

APPLICATION GUIDELINES

Formulated for standard and fine pitch stencil printing at speeds between 20 mm/sec (0.79 inch/sec) and 100 mm/sec (4 inch/sec), with stencil thickness of 0.076 mm (0.003 inch) to 0.150 mm (0.006 inch). Typical blade pressures are between 0.16 to 0.39 kg/cm of blade (0.88 to 2.2 lbs/inch of blade), depending upon the print speed and quality of stencil/substrate gasket. The higher the print speed, the higher the blade pressure that is required to achieve a clean wipe of the stencil surface. The reflow process window enables high first pass soldering yield with good cosmetics and minimized rework.

HALOGEN STATUS

ALPHA OM-355 is a zero-halogen product. It passes the standard listed in the Table below:

Standard	Requirement	Test Method	Status
BS EN 14582:2007 Characterization of waste – Halogen and sulfur content – Oxygen Combustion ins closed systems and determination methods	< 1000 ppm Br, Cl, F in solder material solids	SGS Halogen Cl, Br, I, F- DIN EN-14582	Pass
RoHS	RoHS Directive EU/2015/863; amending Annex II of 2011/65/EU Detection Criteria ≤ 2 to 5mg/kg Permissible Limit ≤ 1000mg/kg	IEC 62321:2013 & IEC 62321:2008	Pass
REACH	Concentrations of tested SVHC are ≤ 0.1% (w/w)	SGS In-House Method	Pass

TECHNICAL DATA

Category	Results	Procedures/Remarks
Chemical Properties		
Activity Level	ROL0	IPC J-STD-004B
Halide Content	Pass	IPC J-STD-004B
Halogen Test	Pass	EN14582, by IC combustion, Non-detectable (ND) at < 50 ppm
Copper Mirror Test	Pass	IPC J-STD-004B
		JIS Z 3197:1999, 8.4.2
Copper Corrosion Test	Pass	IPC J-STD-004B
		JIS Z 3197:1999, 8.4.2
Electrical Properties		
SIR (7 days, 40 °C / 90% RH, 12V bias)	Pass	IPC-TM-650 2.6.3.7
		JIS Z 3197:1999: 8.3 (Pass ≥ 1 x 10 ⁸ ohm)
Electromigration (7 days, 85 °C / 85% RH, -50V, 100V measure)	Pass	IPC-TM-650 2.6.14.1
		JIS Z 3197:1999: 8.3
Physical Properties		
Color	Clear residue	
Tack Force	Pass, 24 hours at 50% RH	IPC J-STD-005
Solder Ball	Pass	IPC J-STD-005
Spread	Pass	IPC J-STD-005
Stencil Life	12 hours	@ 24 °C, 22% RH
Cold Slump 25 °C / 50% RH	Pass	IPC J-STD-005
Hot Slump 150 °C / 10 min	Pass	IPC J-STD-005
Dryness Test (Talc)	Pass	IPC J-STD-005

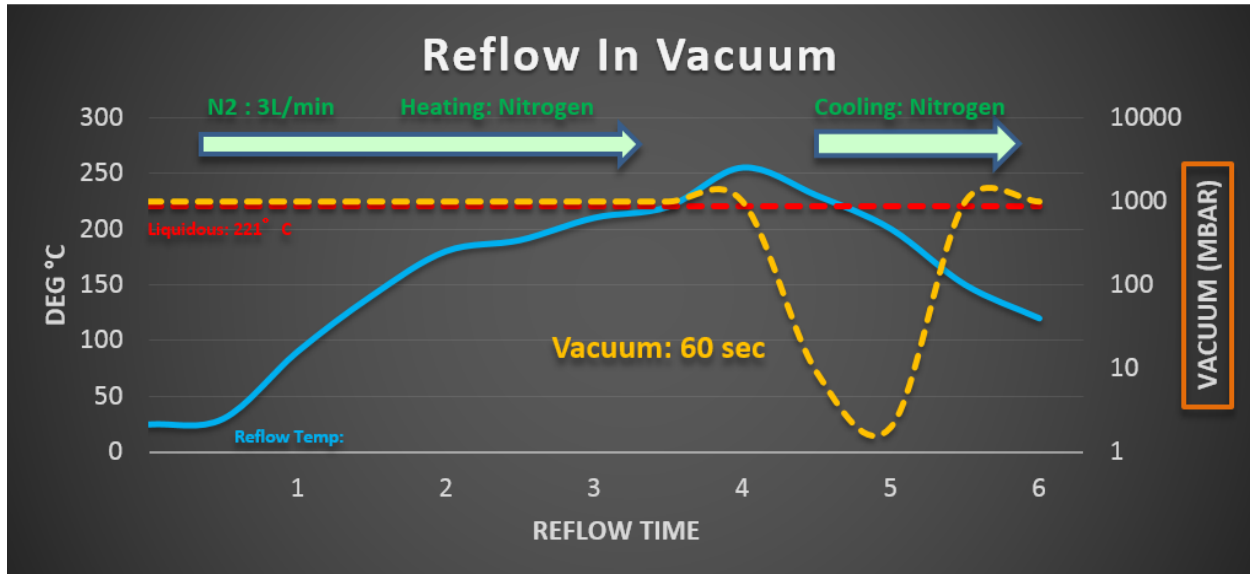
PROCESSING GUIDELINES

The following process settings are offered as a process window guideline based on typical SMT assembly. Due to the variation in the industry, the optimum process setting will need to be developed for each process.

Storage & Handling	Printing	Reflow (See Fig. 1 & 2)	Cleaning
<ul style="list-style-type: none"> Refrigerate @ 0 to 10 °C (32 to 50 °F) to guarantee stability over shelf life. Under these conditions, shelf life is 180 days. After removing paste from refrigeration, ensure paste is at room temperature before opening to avoid moisture condensing on the paste. Typically, 4 hours is sufficient. Verify paste temperature with a thermometer to ensure paste is at least 19 °C (66 °F) or greater before setup of printer. Do not accelerate warm up by exposing paste to greater than room temperature. Paste can be manually stirred before use. A rotating / centrifugal force mixing operation is not required. If rotating / centrifugal force mixing is used, 30 to 60 seconds at 300 RPM is adequate. Ensure the paste does not exceed greater than room temperature from mixing. Do not remove worked paste from stencil and mix with unused paste in jar. This will alter the rheology of unused paste. 	<p>Stencil: Recommend Alpha's ALPHA CUT or ALPHA FORM stencils between 0.076 mm (0.003 inch) to 0.150 mm (0.006 inch) thick for 0.4 to 0.5 mm (0.016 to 0.020 inch) pitch.</p> <p>Stencil design is subject to many process variables and Circuit Card designs. Contact your local CTS Engineer for recommendations.</p> <p>Squeegee: A Metal blade is recommended</p> <p>Pressure: 0.16 to 0.39 kg/cm of blade (0.88 to 2.2 lbs/inch of blade) depending on blade type and contact angle.</p> <p>Speed: 20 mm/sec (0.79 inch/sec) and 100 mm/sec (4 inch/sec) depending on board design and process capability.</p> <p>Paste Roll: 1.5 to 2.0 cm diameter. Additions typically made when roll reaches 1 cm (0.4 inch) diameter (min.). Max roll size will depend upon blade and blade holder.</p> <p>Stencil Release Speed: 7 mm/sec until the paste is fully released from all apertures has shown well defined print deposits.</p> <p>Lift Height: 8 to 14mm (0.31 to 0.55 inch) depending on type of blade holder.</p>	<p>Atmosphere: Designed for Vacuum Reflow but capable of reflow in Clean-dry air or Nitrogen atmosphere.</p> <p>Profile: A gradual increase in vacuum directly after peak reflow is recommended. For detailed vacuum reflow recommendations, reference application bulletin or contact your local Alpha Application Engineer for further details.</p>	<p>ALPHA OM-355 residue is designed to remain on the board after reflow.</p> <p>If reflowed residue cleaning is required, follow commercially available electronics assembly cleaner recommendations from Zestron and Kyzen for best results. Contact your local Alpha Technical Support for more information.</p> <p>Misprints and stencil cleaning may also be done with ALPHA SM-110E, ALPHA SM-440, ALPHA BC-2200 cleaners.</p>

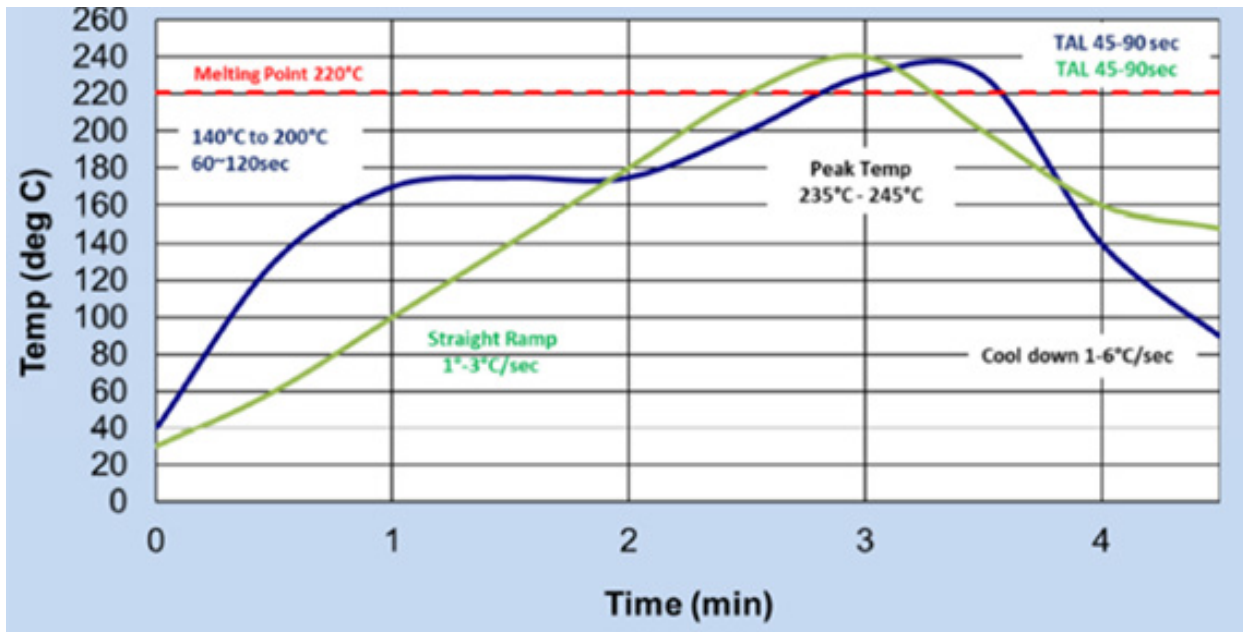
REFLOW PROFILES

Figure 1 – ALPHA OM-355 General Vacuum Reflow Profile Recommendation



*Please note these are only recommended reflow parameters. Additional work may be required to optimize customer process.

Figure 2 – ALPHA OM-355 Typical Non-Vacuum Reflow Profile Recommendation



NOTE: Please take note that the profiles above are only recommendations offered as a starting point. Equipment and assembly (PCB and parts) may require adjustments be made to the profile to meet other criteria.

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.**

CONTACT INFORMATION

To confirm this document is the most recent version, please contact Assembly@MacDermidAlpha.com

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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