

ALPHA[®] Solder Pastes for PV Application

Printing and Dispensing Solder Pastes

DESCRIPTION

Recognizing that there are different requirements, Alpha has a range of solder pastes recommended for specific PV Module applications.

ALPHA OM-550 is a low temperature chemistry paired with Alpha's HRL1 alloy. This alloy was designed to exhibit improved thermal cycling performance versus existing low temperature alloys. Low reflow peak temperature of around 175°C is required for HRL1.

ALPHA OM-535 is a low temperature solder paste with ALPHA SBX02 alloy. The alloy melting point below 140 °C, has been successfully used with peak reflow profiles between 155 °C and 190 °C.

ALPHA CVP-520 is designed to enable low temperature surface mount assembly technology. The lead-free alloy SnBi0.4Ag in **ALPHA CVP-520** has a melting point below 140 °C, and has been successfully used with peak reflow profiles between 155 °C and 190 °C. The flux residue from **ALPHA CVP-520** is clear, colorless, and provides excellent electrical resistivity, exceeding industry standards.

All parts used with **ALPHA OM-550**, **ALPHA OM-535** and **ALPHA CVP-520** must be lead-free to eliminate the formation of tin/lead/bismuth phase which has a melting point under 100 °C.

ALPHA CVP-390 is a lead-free, zero-halogen no-clean solder paste designed to enable consistent fine pitch printing capability. Its excellent print volume deposit repeatability also provides value by reducing defects associated with print process variability.

ALPHA OM-5100 is a low residue, no-clean solder paste designed to maximize process yields. The flux vehicle is rheologically formulated to provide excellent repeatability and resistance to environmental conditions. The **ALPHA OM-5100** activation system has been optimized to enhance joint solderability, limit soldering defects and maintaining long term reliability. **ALPHA OM-5100**'s wide reflow profile window enables soldering of lead free components with this tin lead paste.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

PRODUCT INFORMATION

Category	ALPHA OM-550	ALPHA OM-535	ALPHA CVP-520
Alloy	HRL1	SBX02	SnBi0.4Ag
Application	Printing	Printing	Printing
Packaging	500g jar, syringe	500g jar, syringe	500g jar, syringe

Category	ALPHA CVP-390	ALPHA OM-5100
Alloy	SAC305, SACX0307	63Sn37Pb
Application	Printing	Dispensing
Packaging	500g jar, syringe	500g jar, syringe

APPLICATION GUIDELINES
Printing

- **STENCIL:** Recommend ALPHA CUT, ALPHA NICKEL-CUT, ALPHA TETRABOND or ALPHA FORM stencils at 0.100 to 0.150 mm (4 to 6 mil) thick. Stencil design is subject to many process variables. Contact your local Alpha stencil site for advice.
- **SQUEEGEE:** Metal (recommended)
- **PASTE ROLL:** 1.5 to 2.0 cm (0.6 to 0.8 inch) diameter and make additions when roll reaches 1.0 cm (0.4 inch) diameter (min). Max roll size will depend upon the blade.
- **PRESSURE:** 0.07 to 0.14 kgf/cm² (1.0 to 2.0 lb/in²) successfully tested at Alpha
- **SPEED:** 25 to 150 mm/s (1 to 6 in/s)
- **STENCIL RELEASE SPEED:** 1 to 10 mm/s (0.04 to 0.4 in/s) successfully tested at Alpha
- **HEIGHT:** 8 to 14 mm (0.31 to 0.55 inch)

Dispensing

Time/pressure dispensers should be set up with manufacturer's guidelines. Pressures of 10 to 20 lbs. are recommended without using vacuum suck back. Read the applications notes following regarding needle gap, stringing, and paste volume.

Reflow

- MACHINE: Use convection, IR, combination ovens, hot -plate, vapor phase, hot gun, heat bar or laser equipment.
- ATMOSPHERE: Clean-dry air or nitrogen atmosphere is acceptable.
- PROFILE: A straight ramp heating to reflow and straight ramp down to room temperature of all joints being soldered.

Cleaning

Misprints and stencil cleaning may be done with ALPHA SM-110 or ALPHA SM-110E.

Clean needles with ALPHA SC-22 and fine wires (or use disposable needles). An ultrasonic bath will assist loosening dried residues. Purge paste with a fine wire and flush with solvent in a squeeze bottle. Needles can also be pre-cleaned by dispensing paste flux (available in syringes from Alpha) through to purge solder particles and make subsequent cleaning easier

TECHNICAL DATA

Category	ALPHA OM-550	ALPHA OM-535	ALPHA CVP-520
Fluxing Ability	Reflowed Solder Paste, Hot Solder Dip, Tin Plate, Tin Hot Dip, Silver Plate, Copper/OSP coated, Gold/Ni, Ag/Pd Plate, Sn/Pb alloy Coatings		
Chemical Properties			
Classification	IPC J-STD-004B: ROL0	IPC J-STD-004B: ROL0	IPC J-STD-004: ROL0
Copper Corrosion	IPC J-STD-004B: No corrosion	IPC J-STD-004B: No corrosion	IPC J-STD-004: No corrosion
Copper Mirror	IPC J-STD-004B: No breakthrough	IPC J-STD-004B: No breakthrough	IPC J-STD-004: No breakthrough
Halide Content	IPC J-STD-004B: Pass	IPC J-STD-004B: Pass	IPC J-STD-004: Pass
Electrical Properties			
SIR	IPC J-STD-004B: Pass Bellcore GR-78: Pass	JIS Z 3197 (2012): Pass	IPC J-STD-004: Pass Bellcore GR-78: Pass
ECM	IPC J-STD-004B: Pass Bellcore GR-78: Pass	JIS Z 3197 (2012): Pass	JIS Z 3197 (1999): Pass
Physical Properties			
Color	Clear, Colorless Flux Residue	Light yellow ~ Yellow Flux Residue	Clear, Colorless Flux Residue

Category	ALPHA CVP-390	ALPHA OM-5100
Fluxing Ability	Reflowed Solder Paste, Hot Solder Dip, Tin Plate, Tin Hot Dip, Silver Plate, Copper/OSP coated, Gold/Ni, Ag/Pd Plate, Sn/Pb alloy Coatings	
Chemical Properties		
Classification	IPC J-STD-004B: ROL0	IPC J-STD-004: ROL0
Copper Corrosion	IPC J-STD-004B: No corrosion JIS Z 3197 (1999): No corrosion	IPC J-STD-004: No corrosion
Copper Mirror	IPC J-STD-004B: No breakthrough JIS Z 3197 (1999): No breakthrough	IPC J-STD-004: No breakthrough
Halide Content	IPC J-STD-004B: Pass	IPC J-STD-004: Pass
Electrical Properties		
SIR	IPC J-STD-004B: Pass	IPC J-STD-004: Pass Bellcore GR-78: Pass
ECM	JIS Z 3197 (1999): Pass Bellcore GR-78: Pass	Bellcore GR-78: Pass
Physical Properties		
Color	Clear, Colorless Flux Residue	Clear, Colorless Flux Residue

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.**

STORAGE

ALPHA Solder Pastes should be stored in a refrigerator upon receipt at 0 to 10 °C (32 to 50 °F).

ALPHA Solder Pastes 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

<p>North America 300 Atrium Drive Somerset, NJ 08873, USA 1.800.367.5460</p>	<p>Europe Unit 2, Genesis Business Park Albert Drive Woking, Surrey, GU21 5RW, UK 44.01483.758400</p>	<p>Asia 8/F., Paul Y. Centre 51 Hung To Road Kwun Tong, Kowloon, Hong Kong 852.3190.3100</p>
--	--	---

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

DISCLAIMER: All statements, technical information and recommendations contained herein are based on tests we believe to be reliable, but the accuracy or completeness thereof is not guaranteed. No statement or recommendation shall constitute a representation unless set forth in an agreement signed by officers of seller and manufacturer. NO WARRANTY OF MERCHANTABILITY, WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY IS MADE. The following warranty is made in lieu of such warranties and all other warranties, express, implied, or statutory. Products are warranted to be free from defects in material and workmanship at the time sold. The sole obligation of seller and manufacturer under this warranty shall be to replace any noncompliant product at the time sold. Under no circumstances shall manufacturer or seller be liable for any loss, damage or expense, direct, indirect, incidental or consequential, arising out of the inability to use the product. Notwithstanding the foregoing, if products are supplied in response to a customer request that specifies operating parameters beyond those stated above, or if products are used under conditions exceeding said parameters, the customer by acceptance or use thereof assumes all risk of product failure and of all direct, indirect, incidental and consequential damages that may result from use of the products under such conditions, and agrees to exonerate, indemnify, defend and hold harmless MacDermid, Incorporated and its affiliates therefrom. No suggestion for product use nor anything contained herein shall be construed as a recommendation to use any product in a manner that infringes any patent or other intellectual property rights, and seller and manufacturer assume no responsibility or liability for any such infringement.

© 2019 MacDermid, Inc. and its group of companies. All rights reserved. "(R)" and "TM" are registered trademarks or trademarks of MacDermid, Inc. and its group of companies in the United States and/or other countries.