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MacDermid Alpha ELECTRONICS SOLUTIONS

TECHNICAL DATA SHEET

ALPHA® OM-340 SOLDER PASTE

No-Clean, Lead-Free, Fine Feature, Zero-Halogen, Low HiP, Highly Pin-Testable

DESCRIPTION

ALPHA OM-340 is a lead-free, no-clean solder paste designed for a broad range of applications. It provides best-in-class low defect rate for head-in-pillow defects combined with excellent first pass yield on ICT/pin testing. **ALPHA OM-340** also yields excellent print capability performance across various board designs and, particularly with ultra-fine feature repeatability and high "throughput" applications.

An outstanding reflow process window delivers superior soldering on CuOSP with excellent coalescence on a broad range of deposit sizes and excellent random solder ball resistance and mid-chip solder ball performance. **ALPHA OM-340** is formulated to deliver excellent visual joint cosmetics and best-in-Class 1n circuit pin test yields. Additionally, **ALPHA OM-340**'s capability of IPC-7095 Class 3 for voiding and ROL0 IPC classifications ensures maximum long-term product reliability.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES & BENEFITS

- Maximizes reflow yield for lead-free processing, allowing full alloy coalescence at circular dimensions as small as 200 µm (8 mil) with 100 µm (4 mil) thick stencils
- Excellent print consistency with high process capability index across all board designs
- Print speeds of up to 150 mm/s (6 in/s), enabling a fast print cycle time and a high throughput
- Wide reflow profile window with good solderability on various board / component finishes
- Excellent solder and flux cosmetics after reflow soldering
- Best-in-class low defect rate for head-in-pillow
- Best-in-Class 1n circuit pin test yield
- Reduction in random solderballing levels, minimizing rework, and increasing first time yield
- Meets highest IPC-7095 voiding performance classification of Class 3
- Excellent reliability properties, halide-free material
- Compatible with either nitrogen or air reflow
- Zero-halogen (No halogen intentionally added to the formulation)

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PRODUCT INFORMATION

Alloys:	SAC305, SAC405, Sn96Ag4, SACX® Plus 0307, SACX Plus 0807, Innolot
Powder Size:	Type 3, Type 4, Type 4.5, Type 5, & Type 6
Packaging Sizes:	500 gram jars, 6 & 12 inch cartridges and 10 cc & 30 cc dispense syringes
FluxGel:	ALPHA OM-340 Flux Gel is available in 10 cc and 30 cc syringes for rework applications.
Lead Free:	Complies with RoHS Directive EU/2015/863

APPLICATION GUIDELINES

Formulated for both standard and fine pitch stencil printing, at print speeds of between 25 mm/sec (1 in/s) and 150 mm/sec (6 in/s), with stencil thickness of 100 µm (4 mil) to 150 µm (6 mil), particularly when used with ALPHA Stencils. Blade pressures should be 0.18 to 0.27 kg/cm of blade (1.0 to 1.5 lbs/in), depending upon the print speed. The higher the print speed employed, the higher the blade pressure that is required. The reflow process window will give high soldering yield with good cosmetics and minimized rework.

HALOGEN STATUS

Halogen Standards			
Standard	**Requirement**	**Test Method**	**Status**
JEITA ET-7304 Definition of Halogen Free Soldering Materials	< 1000 ppm Br, Cl, F in solder material solids	TM EN 14582	Pass
IEC 612249-2-21	Post Soldering Residues contain < 900 ppm each or total of < 1500 ppm Br or Cl from flame retardant source		Pass
JEDEC A Guideline for Defining "Low Halogen" Electronics	Post soldering residues contain < 1000 ppm Br or Cl from flame retardant source		Pass
Zero-Halogen: No halogenated compounds have been intentionally added to this product			

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TECHNICAL DATA

Category	Results	Procedures/Remarks
Chemical Properties		
Flux Classification	ROL0	IPC J-STD-004B/004D
Halide Content	Halide-free (by titration). Passes Ag Chromate Test	IPC J-STD-004B
Halogen Content	Pass, Zero Halogen - No halogen intentionally added	EN14582
Copper Mirror	Pass, Low activity, no breakthrough	IPC J-STD-004B
Copper Corrosion Test	Pass, Low activity, no corrosion	IPC J-STD-004B
Electrical Properties		
SIR (IPC 7 days @ 85 °C/85% RH)	Pass, ≥ 10^8 ohm	IPC J-STD-004A
SIR (IPC 7 days @ 40 °C/90% RH)	Pass, ≥10^8 ohms for 7 days down to 100 µm spacing	IPC J-STD-004B
SIR (IPC 7 days @ 85 °C/85% RH)	Pass, ≥10^8 ohms for 7 days	IPC J-STD-004C
SIR (Bellcore 96 hrs @ 35 °C /85% RH)	Pass, ≥ 10^{11} ohm	GR78-Core
Electromigration (Bellcore 96hrs @ 65 °C/85% RH 10V 500 hrs)	Pass, (final > initial/10)	GR78-Core
Physical Properties		
Color	Clear, Colorless Flux Residue	
Tack Life	Pass, Change of <1 g/mm^2 over 24 hrs @ 25 ± 2 °C and 50 ± 10% Relative Humidity	IPC J-STD-005 TM-650 2.4.44
	Pass, Change of <10% when stored at 25 ± 2 °C and 50 ± 10% Relative Humidity	JIS Z 3284: Annex 9

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Category	Results	Procedures/Remarks
Solderball	Acceptable (SAC305 and SAC405)	IPC J-STD-005
	Pass, Class I - 1hr & 72hrs	DIN Standard 32 513, 4.4
Stencil Life	8 hours	@ 50% RH, 25 °C (74 °F)
Spread	Pass	JIS Z 3197: 1999 8.3.1.1
Cold Slump (25 °C /50% RH)	Pass, no bridging at 0.20 mm gap & above	IPC J-STD-005A
	Pass, no bridging at 0.20 mm gap & above	JIS Z 3284:1994 Annex 7
Hot Slump (150 °C/10 min)	Pass, no bridging at 0.25 mm gap & above	IPC J-STD-005A
	Pass, no bridging at 0.40 mm gap & above	JIS Z 3284:1994 Annex 8

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PROCESSING GUIDELINES

Storage and Handling	Printing	Reflow (See Fig 1 & 2)	Cleaning
• Refrigerate to guarantee stability @ 0 to 10 °C (32 to 50 °F) • Shelf life of refrigerated paste is 6 months. • Paste can be stored for 2 weeks at room temperatures up to 25 °C (77 °F) prior to use. • When refrigerated, warm-up of paste container to room temperature for a minimum of 4 hours. 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. In some conditions, up to 8 hours may be necessary to ensure paste temperature is greater than 19 °C prior to use. Printing can be performed at temperatures up to 32 °C (89 °F). • Paste can be manually stirred before use. A rotating, centrifugal force mixing operation is not required. If a rotating/centrifugal force mixing is used, 30 to 60 seconds at 300 RPM is adequate. • Do not remove worked paste from stencil and mix with unused paste in jar. This will alter rheology of unused paste.	**Stencil:** Recommend ALPHA CUT, ALPHA NICKEL-CUT, ALPHA TETRABOND, or ALPHA FORM stencils @ 0.100 to 0.150 mm (4 to 6 mil) thick for 0.4 to 0.5 mm (0.016 inch or 0.020 inch) pitch. Stencil design is subject to many process variables. Contact your local ALPHA representative for advice. **Squeegee:** Metal (recommended) **Paste Roll**: 1.5 to 2.0 cm diameter and make additions when roll reaches 1 cm (0.4 in) diameter (min). Max roll size will depend upon blade **Pressure:** 0.45 to 0.7 kg/in **Speed:** 25 to 150mm per second (1 to 6 inches per second). **Stencil Release Speed:** 3 to 10 mm/s **Print Pump Head:** Passes DEK ProFlow® compatibility test	**ATMOSPHERE:** Clean-dry air or nitrogen atmosphere. **PROFILE (SAC Alloys):** Acceptable reflow / coalescence for feature size down to 8 mil (200 µm). IPC Class 3 voiding obtained for both straight ramp and soak profiles. Compatible with most common surface finishes. (ENTEK HT, ENTEK OM, Alpha Star, ENIG, SACX HASL) NOTE 1: Refer to component and board supplier data for thermal properties at elevated temperatures. Lower peak temperatures require longer TAL for improved joint cosmetics. Keeping the peak temperature below 240 °C will lower the amount of voiding.	**ALPHA OM-340** residue is designed to remain on the board after reflow. If reflowed residue cleaning is required, the following aqueous cleaners are recommended: In-line or Batch Cleaners: **ALPHA BC-2200** Zestron Vigon A201 Zestron Vigon A250 Zestron Vigon N 600 Zeston Vigon NX 728 Manual or solvent cleaning: **ALPHA SM-110** **ALPHA SM-110E** Misprints and stencil cleaning may be done with the following cleaners: **ALPHA SM-110E** **ALPHA SM-440** Zestron Vigon SC200

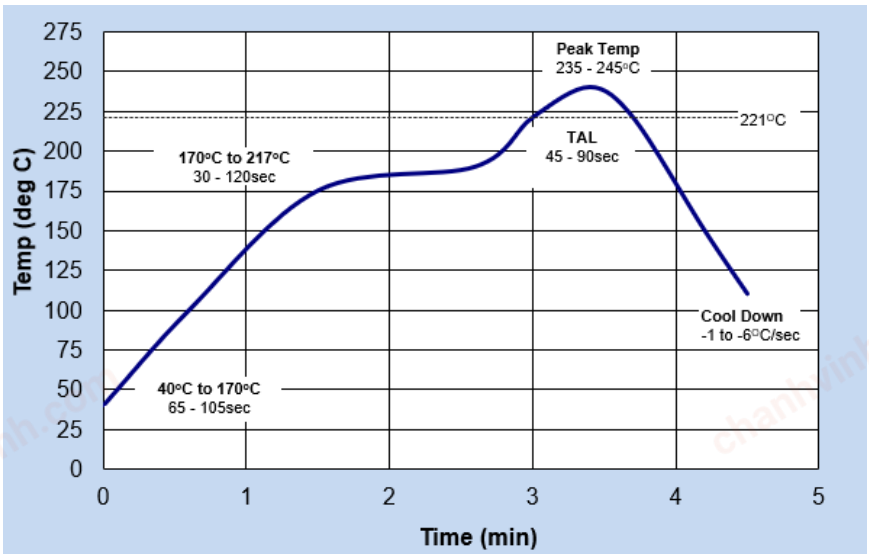
These are starting recommendations and all process settings should be reviewed independently.

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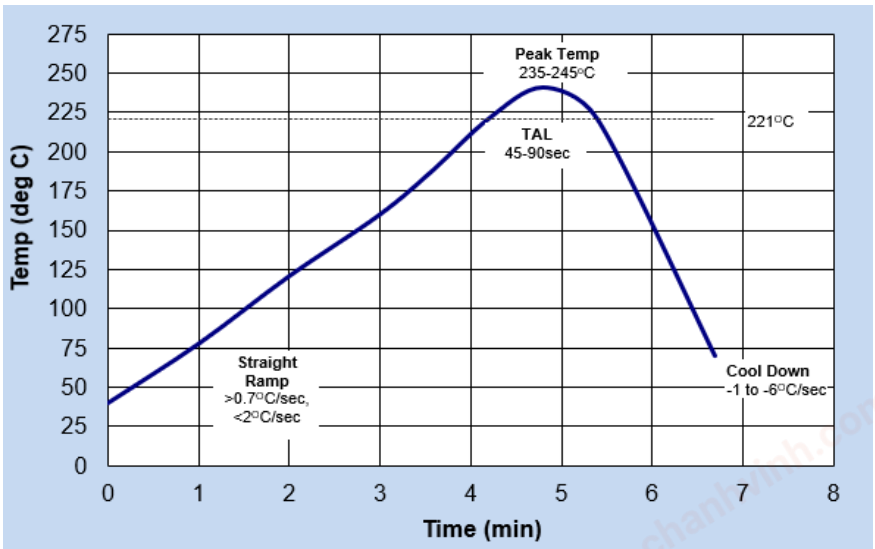
REFLOW PROFILES

ALPHA OM-340 SAC305 & Innolot Typical Reflow Profile Recommendation

Soak Profile: SAC305 and Innolot



Straight Ramp: SAC305 and Innolot



NOTE 2: The processing guidelines recommended and typical reflow profiles presented were tested in the lab with acceptable performance. Optimization to each board application should still be carried out by users to ensure best results.

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TECHNICAL DATA SHEET

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.



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.**

CONTACT INFORMATION

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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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