ALPHA® OM-340(R9) SAC305 SOLDER PASTE

A CircularSolder Offering with Guaranteed >90% Recycled Tin in Alpha's Fine Feature, Zero-Halogen, Low HiP, Highly Pin-Testable No-Clean Paste

DESCRIPTION

ALPHA OM-340(R9) SAC305 features minimum 90% recycled tin content in the same all-purpose no-clean solder paste designed for a broad range of applications.

ALPHA OM-340(R9) SAC305 provides best-in-class low defect rate for head-in-pillow defects combined with excellent first pass yield on ICT/pin testing. It 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(R9) SAC305** is formulated to deliver excellent visual joint cosmetics and best-in-class in circuit pin test yields. Additionally, **ALPHA OM-340(R9) SAC305**'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 in 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)

PRODUCT INFORMATION

Alloy:	>90% Recycled Tin SAC305
Powder Size:	Type 4
Packaging Sizes:	500 gram jars, 6 & 12 inch cartridges
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
Halogen Content:	Zero-halogen

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 0.45 to 0.7 kg/cm of blade (1.0 to 1.55 lbs/in) for 0.4 to 0.5 mm (0.016 inch or 0.020 inch) pitch. 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			

TECHNICAL DATA

Category	Results	Procedures/Remarks
Chemical Properties		
Flux Classification	ROL0	IPC J-STD-004B
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 (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
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)

Category	Results	Procedures/Remarks
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

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.

Speed: Formulated for stencil printing at speeds between 25 mm/s (1 in/s) and 150 mm/s (6 in/sec).

Pressure: Typical blade pressures are between 0.45 kg/cm (1.0 lbs/in) to 0.7 kg/cm (1.55 lbs/in) depending upon the print speed and quality of stencil /substrate gasket. Higher blade pressure is required to achieve a clean stencil surface for applications requiring higher print speed.

Paste Roll: Paste roll between 1.5 cm (0.60 in) to 2.0 cm (0.80 in) in diameter is recommended for optimum performance with paste additions made when roll reaches 1.0 cm (0.40 in) diameter (Min). Max roll size will depend upon blade.

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: Recommend Metal Squeegee angle 60°.

Stencil Release Speed: 3-10 mm/s.

Print Pump Head: Passes DEK ProFlow® compatibility test.

Cleaning: ALPHA OM-340(R9) SAC305 residue is designed to remain on the board after reflow. When cleaning is required, the following aqueous cleaners are recommended:

In-line or Batch: **ALPHA BC-2200,** Zestron Vigon A201, Zestron Vigon A250, Zestron Vigon US

Manual or Solvent Cleaning: **ALPHA SM-110, ALPHA SM-110E**

Misprints and stencil cleaning: **ALPHA SM-110E, ALPHA SM-440,** Zestron Vigon SC200

Storage & Handling:

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

Refrigerate to guarantee stability @ 0 to 10 °C (32 to 50 °F). When stored under these conditions, shelf life of ALPHA CVP-390V(R9) SAC305 is 6 months. When refrigerated, warm up paste container to room temperature for up to 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 set up of printer. Paste can be stored for maximum 2 weeks at room temperature up to 25 °C (77 °F) prior to use. 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 the rheology of unused paste.

REFLOW PROFILES

Atmosphere: Capable of reflow in Air and N_2 environments.

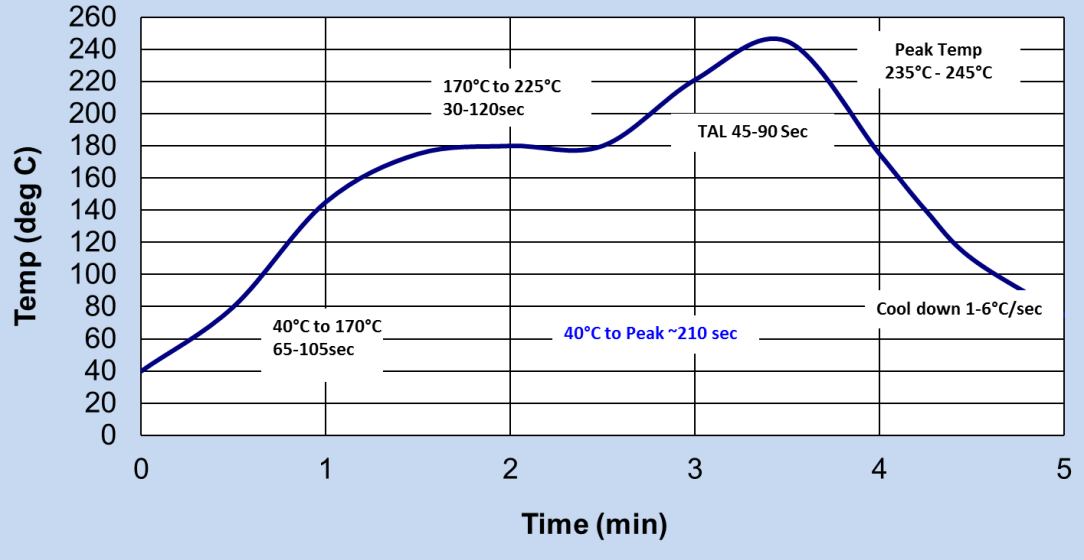
PROFILE (SAC Alloys): Acceptable reflow / coalescence for feature size down to 8 mil (200 µm). IPC Class III voiding obtained for both straight ramp and soak profiles.

Compatible with most common surface finishes. (ENTEK HT, ENTEK OM, Alpha Star, ENIG, SACX HASL)

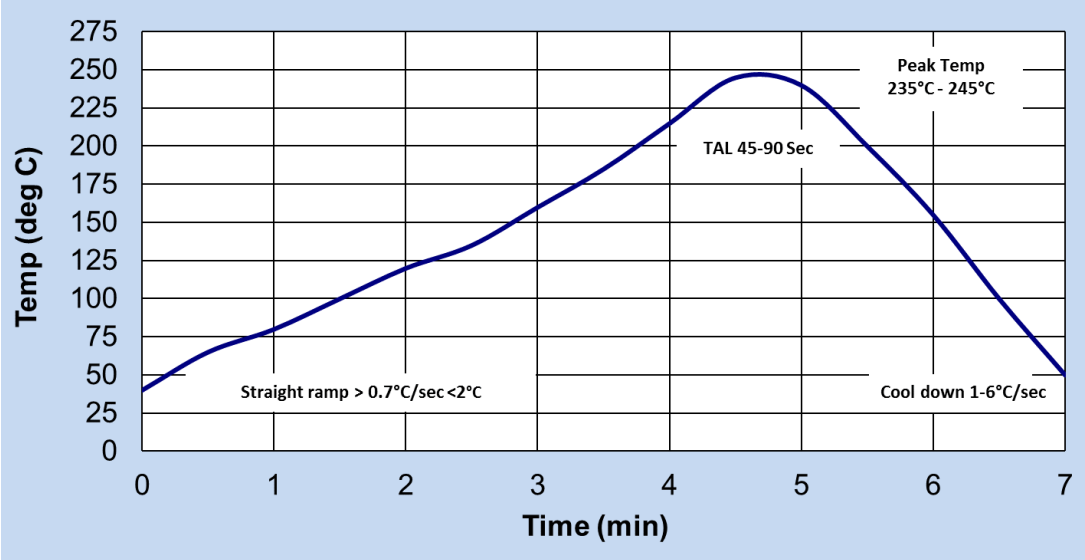
NOTE 1: Refer to component and board supplier data for thermal properties at elevated temperatures. Lower peak temperatures require longer TAL for improved joint cosmetics. Keeping the peak temperature below 240 °C will lower the amount of voiding.

ALPHA OM-340(R9) SAC305 Typical Reflow Profile Recommendation

Soak Profile: ALPHA OM-340(R9) SAC305

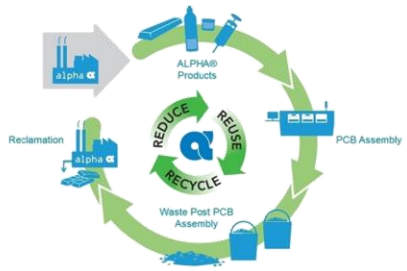


Straight Ramp: ALPHA OM-340(R9) SAC305



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.

MacDermid Alpha CircularSolder Program



MacDermid Alpha CircularSolder represents a closed-loop approach to solder sourcing and recycling. **MacDermid Alpha CircularSolder** participants actively reduce the environmental impact of electronic assemblies by minimizing reliance on resource-intensive tin mining and processing by substituting with recycled materials in our leading paste formulations.

Program participants play a pivotal role by contributing their solder waste in the form of solder dross, solder scrap, or various forms of solder paste waste which we then responsibly recover and reintroduce into the market.

By integrating our recycling services with our advanced solder paste production capabilities **MacDermid Alpha CircularSolder** harmonizes social and environmental initiatives with practical industry needs.

Embrace change with CircularSolder and join us in shaping the future of sustainable electronics.

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

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

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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