ALPHA® OM-363

No-Clean, Halogen-Free, Lead-Free Solder Paste

DESCRIPTION

ALPHA OM-363 is a lead-free, halogen-free, no-clean solder paste designed for minimizing BGA non-wet opens and head-in-pillow defects. This paste chemistry continues Alpha's tradition of being an industry leader in providing excellent pin testing property for high first pass ICT yields.

ALPHA OM-363 is also designed to enable consistent fine pitch printing capability, down to 180µm circle printed with 100µm thickness stencil. Its excellent print volume deposit repeatability also provides value by reducing defects associated with print process variability. Additionally, **ALPHA OM-363** achieves IPC7095 Class 3 voiding performance.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES & BENEFITS

Long Stencil Life: consistent performance for at least 8 hours of continuous printing without addition of new paste

Long, High Tack Force Life: ensures high pick-and-place yields, good self-alignment

Wide Reflow Profile Window: allows best quality solderability of complicated, high density PWB assemblies in both air and nitrogen reflow, using ramp and soak profiles, as high as 175 to 185 °C

Reduced Random Solder Ball Levels: minimizes rework and increases first time yield

Excellent Coalescence and Wetting Performance: coalesced 180µm circle deposit, even at high soak profile environment

Excellent Solder Joint and Flux Residue Cosmetics: after reflow soldering, even using long/high thermal soaking, without charring or burning

Excellent Voiding Performance: Meets IPC7095 Class 3 Requirement

Halogen Content: Halogen-free

Residue: Excellent pin testing property

Safe and Environmentally Friendly: Materials comply with RoHS and halogen-free requirements (see table below), as well as TOSCA & EINECS

PRODUCT INFORMATION

Alloys:	SAC305 (96.5%Sn/3.0%Ag/0.5%Cu)
Powder Size:	Type 4 capable in air and N2, T5 capable in N2 with <1000ppm O2
Packaging Sizes:	500 gram jar, 6 inch cartridge
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 25mm/sec (1"/sec) and 150mm/sec (6"/sec), with stencil thickness of 0.100mm (0.004") to 0.150mm (0.006"), particularly when used in conjunction with ALPHA Stencils. Blade pressures should be 0.21 to 0.36 kg/cm of blade (1.25 to 1.5 lbs/inch), 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

ALPHA OM-363 is a halogen-free product and passes the standards listed in the table below:

Halogen Standards			
Standard	**Requirement**	**Test Method**	**Status**
IEC 612249-2-21	Post soldering residue contain < 900 ppm each Br or Cl or total of < 1500 ppm Br and Cl from flame retardant	**TM EN 14582** Solids extraction per IPC TM 2.3.34	Pass
JEDEC A Guideline for Defining "Low Halogen"	Post soldering residues contain < 1000 ppm Br or Cl from flame retardant source		Pass

TECHNICAL DATA

Category	Results	Procedures/Remarks
Chemical Properties		
Activity Level	ROL0	IPC J-STD-004B
Halide Content	Halide free (by titration)	IPC J-STD-004B
Fluoride Spot Test	**Pass**	JIS Z 3197:1999 8.1.4.2.4
Halogen Test	**Pass**, Halogen-free	By formulation
Ag Chromate Test	**Pass**	IPC J-STD-004B
	Pass	JIS Z 3197:1999 8.1.4.2.3
Copper Mirror Test	**Pass, L Class**	IPC J-STD-004B
	Pass	JIS Z 3197:1999 8.4.2
Copper Corrosion Test	**Pass**	IPC J-STD-004B
	TBD	JIS Z 3197:1999 8.4.1
Electrical Properties		
Water Extract Resistivity	$4.1X10^5$ Ohm-cm	JIS Z 3197:1999 8.1.1
SIR (7 days, 40°C/90%RH, 12 V bias)	**Pass**	IPC J-STD-004B TM-650 2.6.3.7 (Pass ≥ 1 x 10^8 ohm)
Electromigration (Bellcore 500 hours @ 65°C/85%RH 10V)	**Pass**	Bellcore GR78-CORE Pass=final > initial/10)
JIS Electromigration (1000 hours @ 85°C/85%RH 48V)	**TBD**	JIS Z 3197:1999 8.5.4
Physical Properties		
Color	Clear, Colorless Flux Residue	
Tack Force vs. Humidity	**Pass,** >100gf over 24 hours at 25, 50, and 75% RH	JIS Z 3284:1994, Annex 9
	Pass, change of <1 g/mm2 over 24 hours at 25, 50, and 75% RH	IPC J-STD-005

Category	Results	Procedures/Remarks
Viscosity Stability at 25 ºC for 14 days	Pass	Malcom Spiral Viscometer
Continuous Viscosity Measurement at 25ºC for 24 hours	Pass	Malcom Spiral Viscometer
Coalescence Test	Able to reflow at < 200 µm Cu pad circle size	Internal test, coalescence at 180 µm
Solder Ball	Preferred	IPC J-STD-005 TM-650 2.4.43
Spread	84.5%	JIS Z 3197:1999 8.3.1.1
Stencil Life	8 hours	@ 50% RH 23°C (74°C)
Cold Slump	No bridge 0.1 mm, initial @RT	JIS Z 3284:1994 Annex 7
	No bridge 0.1 mm, Test 2 1 hr @50%RH) (3x0.7mm)	
	No bridge 0.1 mm, Test 2 1 hr @50%RH) (3x1.5mm)	
	Pass	IPC J-D-005 TM-650 6.3.2
Hot Slump	No bridge 0.1 mm, initial @RT	JIS Z 3284:1994 Annex 8
	No bridge 0.3 mm, Test 2 1 hr @50%RH) (3x0.7mm)	
	No bridge 0.4 mm, Test 2 1 hr @50%RH) (3x1.5mm)	
	Pass	IPC J-STD-005 TM-650 6.3.2
Dryness Test (Talc)	Pass	JIS Z 3197:1999 8.5.1

PROCESSING GUIDELINES

Storage & Handling	Printing	Reflow (See Fig. 1)	Cleaning
• Refrigerate to guarantee stability @ 0 to 10 °C (32 to 50 °F). When stored under these conditions, the shelf life of ALPHA OM-363 is 6 months. • Paste can be stored for 2 weeks at room temperature up to 25 °C(77 °F) prior to use • 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 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. • These are starting recommendations and all process settings should be reviewed independently.	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" or 0.020") pitch. Stencil design is subject to many process variables. Contact your local Alpha Sales Rep for more info. SQUEEGEE: Metal (recommended) PRESSURE: 0.21 to 0.36 kg/cm of blade (1.25 to 2.0 lbs/inch) SPEED: 25 to 150 mm per second (1 to 6 inches per second). PASTE ROLL: 1.5 to 2.0 cm diameter and make additions when roll reaches 1-cm (0.4") diameter (min). Max roll size will depend upon blade. STENCIL RELEASE SPEED: 1 to 5 mm/sec. LIFT HEIGHT: 8 to 14mm (0.31 to 0.55")	ATMOSPHERE: Clean-dry air or nitrogen atmosphere. PROFILE (SAC Alloys): Straight Ramp: 0.7 to 2.0 °C/sec ramp profiles, 45 to 60 TAL, Peak Temperature 235 to 245 °C. Soak: 155 to 175°C, 60 to 100 seconds soak profiles have been determined to give optimal results. If required, good results are also achievable with high soak temperature profiles of 175 to 185 °C for 60 seconds. Peak Temperature is 235 to 245 °C. Note 1: Keeping the peak temperature below 241 °C may reduce the number and size of BGA and QFN voids. Note 2: Refer to component and board supplier data for thermal properties at elevated temperatures. Lower peak temperatures require longer TAL for improved joint cosmetics.	ALPHA OM-363 residue is designed to remain on the board after reflow.

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

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

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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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