ALPHA WS698CPS SOLDER PASTE

Water Soluble Lead-Free Solder Paste

DESCRIPTION

ALPHA WS-698CPS is a solder paste designed for a broad range of applications. ALPHA WS-698CPS broad processing window is designed for stencil printing application for either surface mount or solder bumping process.

Outstanding reflow process window delivers good soldering on CuOSP with excellent coalescence on a broad range of deposit sizes, excellent random solder ball resistance and mid-chip solder ball performance. ALPHA WS-698CPS is formulated to deliver excellent visual joint cosmetics. Additionally, ALPHA WS-698CPS capability of IPC Class III for voiding 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 0.25mm (0.010”) with 0.100mm (4miL) stencil thickness.
- Excellent print consistency with high process capability index across all board designs.
- Wide reflow profile window with good solderability on various board / component finishes.
- Reduction in random solderballing levels, minimizing rework and increasing first time yield.
- The flux residues can be easily removed by warm DI water washing.
- PCB, which has been applied with WS698CPS and cleaned with water, results in better cleanliness compared to PCB
- applied with rosin type solder paste and cleaned with a solvent.
- Excellent reliability properties, halogen-free material.

PRODUCT INFORMATION

Alloys: SAC305 (96.5%Sn/3.0%Ag/0.5%Cu)
For other alloys, contact your local Sales Office.
Powder Size: Type 5, 6 per IPC J-STD-005upon request
Packaging Sizes: 500 gram jars, 12" cartridges
Lead Free: Complies with RoHS Directive 2002/95/EC.

APPLICATIONS

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 0.18 to 0.27 kg/cm of blade (1.0 to 1.5 lbs/inch), depending upon the print speed. The higher the print speed employed, the higher the blade pressure that is required.

TECHNICAL DATA

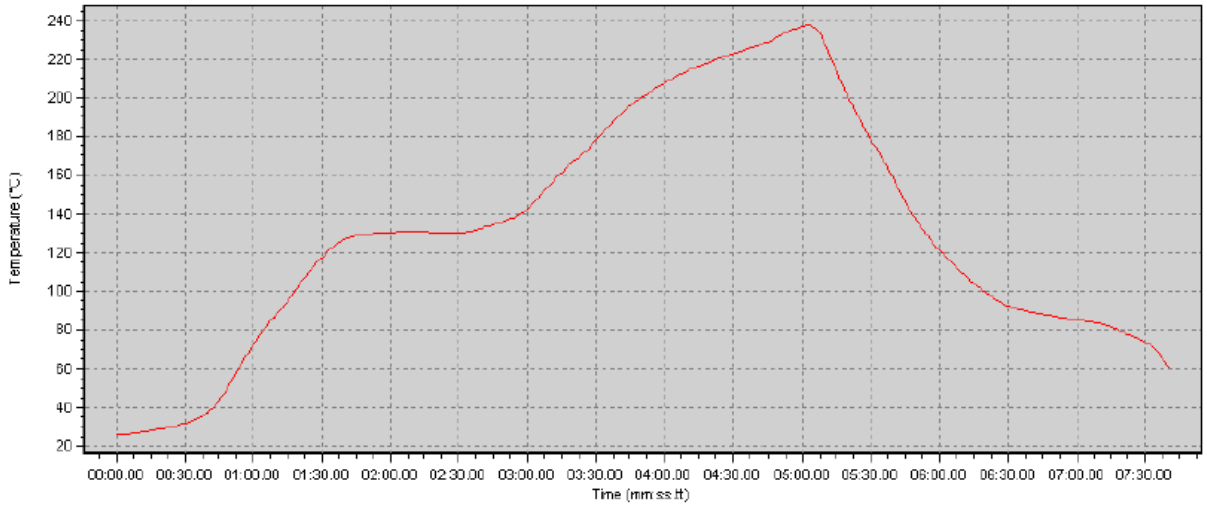
`	Results	Procedures/Remarks
Chemical Properties		
Activity Level	ORH-0 = J-STD Classification	IPC J-STD-004
Copper Corrosion Test	**Pass**, (After residue cleaning)	IPC J-STD-004
Electrical Properties		
SIR (IPC 7 days @ 85 °C/85% RH)	**Pass**, (After residue cleaning)	IPC J-STD-004 {Pass ≥ 1 x 10^8 ohm min}
Physical Properties		
Tack Force	**>100gf**	IPC J-STD-005
Viscosity	**~ 250 to 350 Pass (Typical)** (SAC305 T6)	Malcom Spiral Viscometer; J-STD-005
Solderball	**Acceptable** (SAC 305 and SAC405 alloys)	IPC J-STD-005
	Pass, Class 1	DIN Standard 32 513, 4.4
Stencil Life	**8 hours**	@ 50%RH, 23 °C (74 °F)
Spread	**Pass**	JIS-Z-3197: 1999 8.3.1.1
Slump	**Pass**	IPC J-STD-005 (10 min 150 °C)

PROCESSING GUIDELINES

Storage – Handeling	Printing	Reflow (See Figure #1)	Cleaning
• Refrigerate to guarantee stability @ 0 to 8 °C (32 to 46 °F) • Shelf life testing is still on-going and expected to have refrigerated shelf life of six months. • Paste can be stored for 1 weeks at room temperatures up to 25 °C (77 °F) prior to use. • When refrigerated, warm-up of 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 setup. Printing can be performed at temperatures up to 29 °C (84 °F). • Do not remove worked paste from stencil and mix with unused paste in jar. This will alter rheology of unused paste. These are starting recommendations and all process settings should be reviewed independently.	• STENCIL: Recommend ALPHA CUT or ALPHA FORM stencils @ 0.100 to 0.150 mm (4-6 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 representative for advice. • SQUEEGEE: Metal (recommended) PRESSURE: 0.18 to 0.27 kg/cm of • Squeegee length (1.0 to 1.5 lbs. /inch). • SPEED: 25 to 150mm 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 (.31 to.55")	• ATMOSPHERE: Clean-dry nitrogen atmosphere. • PROFILE (SAC Alloys): • Acceptable reflow / coalescence and IPC Class III voiding were obtained for the range of profiles depicted below. 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.	• ALPHA WS-698CPS residue is designed to be cleaned using warm DI water after reflow. • The flux residues can be cleaned with DI water. For the best results, warm DI water is recommended. **Cleaning Process** • Cleaning Bath #1(50 to 60 °C Temp, Spray) → Cleaning Bath #2 (50 to 60 °C Spray) → Cleaning Bath #3 (50 to 60 °C Rinse) → Dry (Air Blow) • Inline spray with pressurized water jets are recommended • Misprints and stencil cleaning may be done with ALPHA SM- 110E, ALPHA SM-440, ALPHA BC-2200 and Bioact™ SC-10E cleaners.

Parameter	Guideline	Additional Information
Atmosphere	**N_2**	Mass production verification both in air and N_2.
SnAgCu alloy melting ranges. Lower temperature=solidus; higher temperature = liquidus	**SAC305: 217 to 220 °C** **SAC405: 217 to 225 °C**	Use for reflow above liquidus setting

Profile General Guideline (Typical for SAC305)	
Setting Zone	Optimal Dwell Period
40 to 220 °C	3 to 4min
130 to 220 °C	90 to 110 secs
170 to 220 °C	1 min.
Above 220 °C	50 to 70 sec.
Peak temp.	240 °C
Joint cool down rate from 170C	> 3 to 8 °C



Soak 130 to 200 °C 90 to 110S 240 °C Peak 60S TAL-N2 (<1000ppm)

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..**

STORGAE

ALPHA WS-698CPS should be stored in a refrigerator upon receipt at 0 to 8 °C (32 to 46 °F). ALPHA WS-698CPS should be permitted to reach room temperature before unsealing its package prior to use (see handling procedures on page 2). This will prevent moisture condensation build up in the solder paste.

CONTACT INFORMATION

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

www.macdermidalpha.com

North America 3950 Johns Creek Ct, Suite 300 Suwanee, GA 30024 USA 908.791.2300	**Europe** Unit 2, Genesis Business Park Albert Drive Woking, Surrey, GU21 5RW, UK 44.01483.758400	**Asia** 14 Joo Koon Crescent, Singapore 629014 65.6430.0700

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