ALPHA® CVP-380

Zero-Halogen, Ultra-Fine Feature, High-Temperature Stability Lead-Free Solder Paste

DESCRIPTION

ALPHA CVP-380 is a lead-free, zero-halogen no-clean solder paste designed especially for modern hand-held devices where drop shock resistance requirement is not compromised. It is also applicable for use in other applications where fine features are extensively involved.

This product is designed to enable consistent printing capability, up to 200µm circle printed with 80µm thickness stencil. Its excellent print volume deposit repeatability also provides value by reducing defects associated with print process variability.

In addition, it has been innovated from flux chemistry perspective to address the challenge of achieving good coalescence, up to ≤ 200µm small circle size of CSP, in an air reflow environment. Good coalescence is one important attribute to mitigate formation of Head-In-Pillow effect.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES & BENEFITS

- **Long Stencil Life:** consistent performance for at least 6 hours of continuous printing without addition of new paste
- **Stable Paste Viscosity:** allows wide storage and handling window at temperatures up to 35 °C for 5 days, and up to 25 °C for one month
- **Long, High Tack Force Life:** ensures high pick-and-place yields, good self-alignment, and a low tomb-stoning defect rate
- **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 180 to 190 °C
- **Reduced Random Solder Ball Levels:** minimizes rework and increases first time yield
- **Excellent Coalescence and Wetting Performance:** coalesced excellently at small circle level of <200µm, 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
- **Good Voiding Performance:** Meets IPC7095 Class II Requirement with Soak Profile
- **Halogen Content:** Zero-halogen

- **Electrical Reliability:** Classified as ROL0, Passes IPC J-STD-004B and JIS SIR
- **Safe and Environmentally Friendly:** Materials comply with ROHS and Halogen Free requirement, as well as TSCA & EINECS. No toxic material used in the paste

PRODUCT INFORMATION

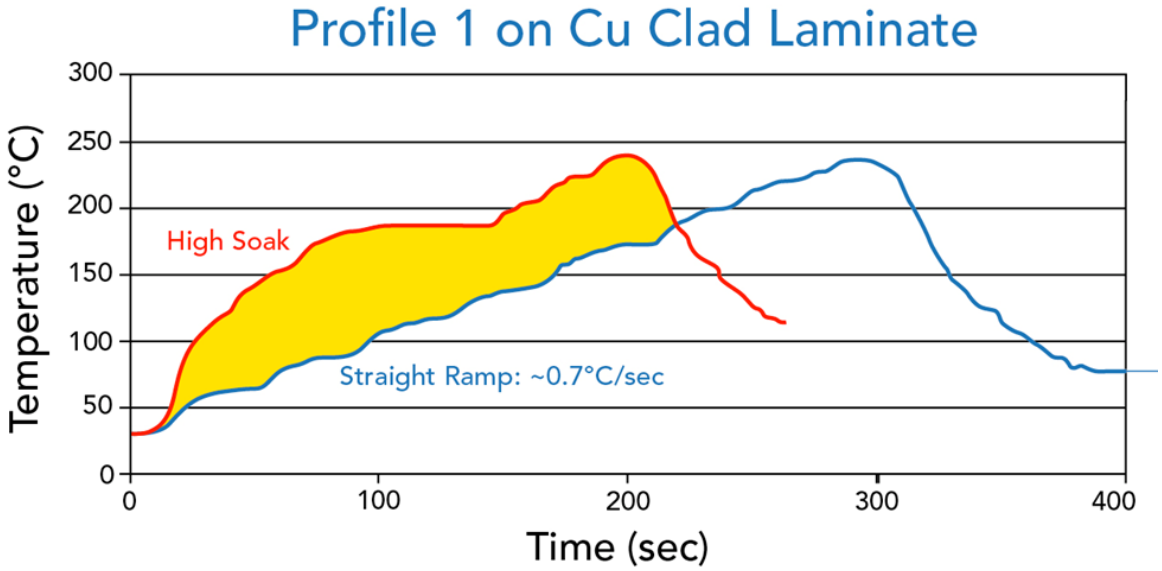
Alloys:	SAC305 (96.5%Sn/3.0%Ag/0.5%Cu)
	For other alloys, contact your local Alpha Sales Office
Powder Size:	Type 3, Type 4, Type 5, & Type 6
Packaging Sizes:	500 gram jars, 6" & 12" cartridges, 0.25 gram jars
Lead Free:	RoHS Directive EU/2015/863; amending Annex II of 2011/65/EU

APPLICATION GUIDELINES

Printing

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 0.22 to 0.27 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.

Reflow



Note: These are profiles that were tested in the lab with acceptable reflow and coalescence performance, optimization to each board application should still be carried out by users to ensure best results.

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		
Activity Level	ROL0	IPC J-STD-004A
Halide Content	Halide free (by titration)	IPC J-STD-004A
Halogen Test	**Pass**, ND	EN14582, by oxygen bomb combustion, Non detectable (ND) at < 50 ppm
Fluoride Spot Test	**Pass**	JIS Z 3197:1999 8.1.4.2.4
Ag Chromate Test	**Pass**	IPC J-STD-004A
	Pass	JIS Z 3197:1999 8.1.4.2.3
Copper Mirror Test	**Pass**	IPC J-STD-004A
	Pass	JIZ Z 3197:1999 8.4.2
Copper Corrosion Test	**Pass**, No Evidence of Corrosion	IPC J-STD-004A
	Pass, No Evidence of Corrosion	JIS Z 3197:1999 8.4.1

Category	Results	Procedures/Remarks
Electrical Properties		
Water Extract Resistivity	134 ohm-m	JIS Z 3197:1999 8.1.1
SIR (IPC 7 days @ 85 °C/85% RH)	**Pass**, 1.4 x 1010 ohms	IPC J-STD-004A (Pass ≥ 1 x 108ohm)
SIR (40 °C /93%RH, 10 volts constant bias voltage, SIR Reading at 10V every 20 minutes for a total 7-days)	**Pass**, Values of > 1010 ohms were registered for all data measured	IPC J-STD-004B TM 2.6.3.7 (Pass ≥ 1 x 108ohm)
SIR (Bellcore 96 hours @ 35 °C/85%RH)	**Pass**	Bellcore GR78-CORE (Pass ≥ 1 x 1011 ohm)
Electromigration (Bellcore 96 hrs @ 65 °C/85%RH 10V 500 hrs)	**Pass**	Bellcore GR78-CORE (Pass=final > initial/10)
JIS Electromigration (1000 hrs @ 85 °C/85%RH 48V 1000 hrs)	**Pass**, Final Reading: > 1 x 1010 ohms No Migration after 1000 hrs	JIS Z 3197:1999 8.5.4
Physical Properties		
Color	Clear, Colorless Flux Residue	
Tack Force vs. Humidity	**Pass**, Change of <1 g/mm2 over 24 hours at 25%, 50% and 75 % Relative Humidity	IPC J-STD-005
Tack Force vs. Time	> 100gf over 24 hours at 25 °C/50% RH	JIS Z-3284-1994, Annex 9
Viscosity	88.2% metal load, Type 4 designated M19 for printing. 88.2% metal load, Type 3 designated M17 for printing	Malcom Spiral Viscometer; 1. J-STD-005 2. JIS Z-3284-1994, Annex 6
Viscosity Stability at 25 °C	**Pass** for 1 month	Malcom Spiral Viscometer
Viscosity Stability at 35 °C	**Pass** for 5 days	Malcom Spiral Viscometer
Continuous Viscosity Measurement at 25 °C	**Pass** for 96 hours	Malcom Spiral Viscosity

Category	Results	Procedures/Remarks
Solder Ball	Preferred, Tested after 4 hours storage @ 25 °C, 50% RH	IPC TM-650 2.4.43
	Pass Level 2, Tested after 4 hours storage at 25 °C @ 25%, 50%, 75% RH	JIS Z-3284 Annex 11
Wetting Time	**Pass** 1 second	Rhesca Test, Time T2 < 3 seconds
Spread	>80%	JIS-Z-3197-1999 8.3.1.1
Hot Slump	**Pass,** No bridge for 0.2mm space	JIS-Z-3284-1994 Annex 8
Dryness Test (Talc)	**Pass**	JIS-Z-3107-1999 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). Shelf life of refrigerated paste is 6 months. Paste can be stored for 4 weeks at room temperatures up to 25 °C (77 °F) prior to use. When refrigerated, warm up paste container to room temperature for up to 4 hrs. 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 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 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 Rep for advice. Squeegee: Metal (recommended) Pressure: 0.22 to 0.27 kg/cm of blade (1.25 to 1.5 lbs/inch) Speed: 25 to 140 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/s Lift Height: 8 to 14mm (.31 to .55")	Atmosphere: Clean-dry air or nitrogen atmosphere. Profile (SAC Alloys): 155 to 175 °C, 60 to 100 s soak profiles have been determine to give the optimal results. If required, good results are also achievable with high soak temperature profiles of 180 to 190 °C for 60 s. Typical peak temperature is 230 to 245 °C. However, whenever possible, maintaining a peak temperature < 240 °C has been deemed to be optimal, to include better voids performance. The time above liquidus is 45 to 90 seconds.	ALPHA CVP-380 residue is designed to remain on the board after reflow. If reflowed residue cleaning is required, agitation for 5 min in the following cleaners is recommended: - ALPHA SM-110E - Kyzen Aquanox A4241 (50 to 60 °C washing temperature recommended) Misprints and stencil cleaning may be done with ALPHA SM-110E and ALPHA BC-2200 cleaners.

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 CVP-380 should be stored in a refrigerator upon receipt at 0 to 10 °C (32 to 50 °F). ALPHA CVP-380 should be permitted to reach room temperature before unsealing its package prior to use (see handling procedures on page 6). This will prevent moisture condensation build up in the solder paste.

CONTACT INFORMATION

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

www.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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