

ALPHA[®] CVP-360

Fine Feature, Pin-Testable, Lead-Free Solder Paste

DESCRIPTION

ALPHA CVP-360 is a lead-free, halogen free no-clean solder paste designed for a broad range of applications. It designed to enable the use of ALPHA SACX[®] and SACX Plus[®] alloys, while offering reflow process yields comparable with higher silver SAC alloys (SAC 305 and SAC 405).

ALPHA CVP-360 also offers extremely high in-circuit pin test yields, which can reduce the circuit board assembly process cycle time due to fewer false negative rework steps. **ALPHA CVP-360**'s excellent print volume deposit repeatability also provides value by reducing defects associated with print process variability. Until now, solder paste with high spread and wetting properties with low silver SAC alloys have had poor in-circuit pin test yields, high halogen levels, or both. **ALPHA CVP-360** eliminates the need to compromise properties when using either **ALPHA SACX 0307** or **ALPHA SACX Plus 0807** alloys.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES & BENEFITS

- Very high reflow process yields on Entek Plus HT OSP, even after 1 prior lead-free reflow.
- Excellent pin-test yield for single and double reflow assemblies.
- Excellent print volume consistency with high process capability index across all board designs.
- Enables the use of ALPHA SACX alloys to minimize the impact of silver's price volatility.
- Excellent solder and flux cosmetics after reflow soldering.
- Reduction in random solderballing levels, minimizing rework and increasing first time yield.
- Halogen free per IPC J-Std 709.
- Halide free per IPC J-Std 004.
- Meets IPC 7095 voiding performance classification II or III depending on reflow profile, feature size and BGA alloy.
- Meets IPC and Bellcore Electrical Reliability requirements.
- Excellent reflow yields without the need for nitrogen.

PRODUCT INFORMATION

<u>Alloys:</u>	SACX 0307 (99%Sn/0.3%Ag/0.7%Cu); SACX Plus 0807 (98.5%Sn/0.8%Ag/0.7%Cu)
<u>Powder Size:</u>	Type 3 Standard, (25-45µm per IPC J-STD-005); Type 4 (20-38µm per IPC J-STD-005) available upon request
<u>Residues:</u>	Approximately 5% by weight
<u>Packaging Sizes:</u>	500 gram jars, 6" & 12" cartridges, DEK ProFlo™ cassettes, and 10cc & 30cc dispense syringes.
<u>Flux Gel:</u>	CVP-360 Flux Gel is available in 10cc and 30cc syringes for rework applications.
<u>Lead-free:</u>	Complies with RoHS Directive 2002/95/EC.

Available ITEM Numbers:

153714	CVP-360	88.5-3-M15	SACX Plus 0807	6" CAR/0.60KG
153715	CVP-360	88.5-3-M15	SACX Plus 0807	12" CAR/1.20KG
153716	CVP-360	88.5-3-M15	SACX Plus 0807	JAR/0.50KG
154228	CVP-360	88.5-3-M15	SACX0307	6" CAR/0.60KG
154229	CVP-360	88.5-3-M15	SACX0307	12" CAR/1.20KG
154230	CVP-360	88.5-3-M15	SACX0307	JAR/0.50KG
154429	CVP360	88.5-3-M15	SACX Plus 0807	DEK Proflow Cassette

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 0.22 to 0.36 kg/cm of blade (1.25 to 2.0 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.

TECHNICAL DATA

Category	Results	Procedures/Remarks
Chemical Properties		
Activity Level	ROM0 = J-STD Classification	IPC J-STD-004
Halide Content	Halide free (by titration). Passes Ag Chromate Test	IPC J-STD-004
Copper Mirror Test	Pass	IPC J-STD-004
Copper Corrosion Test	Evidence of Corrosion	IPC J-STD-004
Electrical Properties		
SIR (IPC 7 days @ 85 °C/85% RH)	Pass	IPC J-STD-004 {Pass ≥ 1 x 10 ⁸ ohm min}
SIR (Bellcore 96 hrs @ 35 °C/85%RH)	Pass	Bellcore GR78-CORE {Pass ≥ 1 x 10 ¹¹ ohm min}
Electromigration (Bellcore 96 hours @ 65 °C/85%RH 10V 500 hours)	Pass	Bellcore GR78-CORE {Pass=final > initial/10}
Physical Properties		Using 88.5% Metal, Type #3 Powder
Color	Clear, Colorless Flux Residue	SACX Plus 0807 & SACX 0307 Alloys
IPC Tack Test	Pass - Change of <1 g/mm ² over 24 hours at 25% and 75 % Relative Humidity	IPC J-STD-005
JIS Tack Test	Pass - Change of <10% when stored at 25±2 °C and 50±10% relative humidity.	JIS Z3284 Annex 9
Viscosity	88.5% metal load designated M15 for printing.	Malcom Spiral Viscometer; J-STD-005
Solderball	Acceptable	IPC J-STD-005
	Pass , Class 1	DIN Standard 32 513, 4.4
Stencil Life	>8 hours	@ 50%RH, 23 °C (74 °F)
Spread	>87.9%	JIS-Z-3197: 1999 8.3.1.1
Slump	Pass	IPC J-STD-005 (10 min 150 °C)
	Pass	DIN Standard 32 513, 5.3
	Pass	JIS-Z-3284-1994 Annex 8

PROCESSING GUIDELINES

Storage-Handling	Printing	Reflow (See Figure #1)	Cleaning
1. Refrigerate to guarantee stability @ 0 to 10 °C (32 to 50 °F) 2. Shelf life of refrigerated paste is 6 months. 3. Paste can be stored for 2 weeks at room temperatures up to 25 °C (77 °F) prior to use. 4. 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 setup. Printing can be performed at temperatures up to 30 °C (86 °F) 5. Do not remove worked paste from stencil and mix with unused paste in jar. This will alter rheology of unused paste. 6. Starting recommendations and all process settings should be reviewed independently.	<u>Stencil:</u> 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. <u>Squeegee:</u> Metal (recommended) <u>Pressure:</u> 0.22 to 0.36 kg/cm of blade (1.25 to 2.0 lbs/inch) <u>Speed:</u> 25 to 150 mm per second (1 to 6 inches per second). <u>Paste Roll:</u> 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. <u>Stencil Release Speed:</u> 3 to 10mm/sec.(0.12 to 0.4 inch/sec.) Lift Height: 8 to 14mm (.31 to .55") <u>Print Pump Head:</u> Compatible with enclosed print head systems.	<u>Atmosphere:</u> Clean-dry air preferred <u>Profile (SACX Alloys):</u> Designed for straight ramp or soak reflow profiles. Soak profile will reduce BGA voiding. Ramp rate between 0.7°C/second and 3.3°/second has been verified. Peak temperature of 235 to 245, with a time above liquidus of 45 to 90 seconds. 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 CVP-360 residue is designed to remain on the board after reflow. If reflowed residue cleaning is required, ALPHA BC-2200 aqueous cleaner is recommended. For solvent cleaning, agitation for 5 min in the following cleaners is recommended: - ALPHA SM-110E - Bioact™ SC-10E - Kyzen Micronox MX2501 Misprints and stencil cleaning may be done with ALPHA SM-110E, ALPHA SM-440, ALPHA BC-2200, Bioact SC-10E or Vigon SC-200 cleaners.

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REFLOW PROFILES

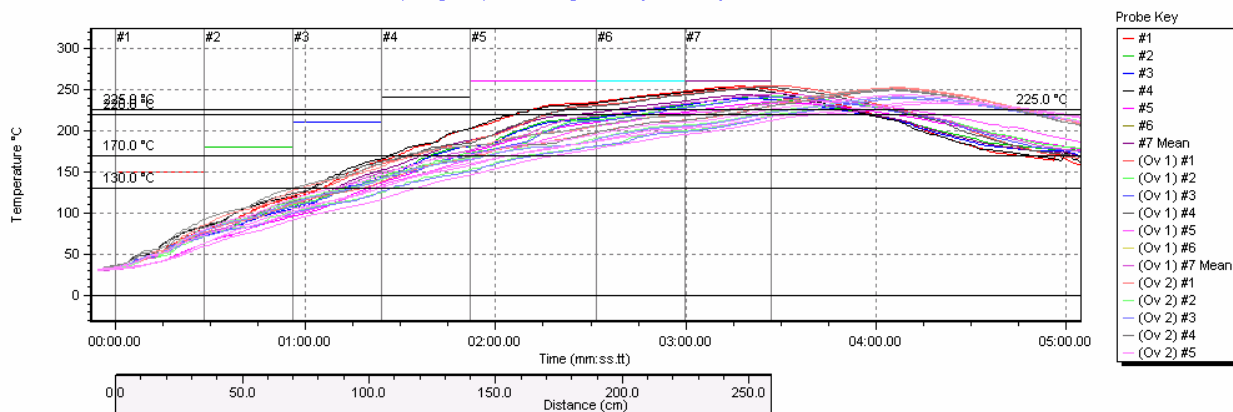
Figure #1 – Reflow Envelope

Parameter	Guideline
Atmosphere	Air Preferred
SnAgCu alloy melting ranges. Lower temperature=solidus; Higher temperature = liquidus	SACX Plus 0807: 217 to 225 °C SACX 0307: 217 to 228 °C
Profile General Guideline	
Setting Zone	Optimal Dwell Period
40 to 228 °C	60 to 260 s
Above 225 °C	45 to 90 seconds.
Peak temp.	< 246 °C
Joint cool down rate from peak	3 to 6 °C/second

Figure #1 – Reflow Envelope

Other Profiles Tested Successfully in Air

Paqfile: Tiger P1, Process: Bangalore SMT [User Zoom]



Profile	Average Time to Reach 130 ° C min:sec	Average Time to Reach 170 ° C min:sec	Average Time Above 220 ° C min:sec	Average Time to Reach 220 ° C min:sec	Average Time Above 225 ° C min:sec	Average Time to Reach 225 ° C min:sec
P1	01:09.5	01:37.5	01:31.0	02:27.5	01:14.5	02:38.0
P2	01:11.0	01:45.0	01:36.0	02:37.0	01:20.5	02:46.0
P3	01:23.5	02:05.0	01:25.5	03:25.0	01:10.5	03:32.5
P4	01:09.0	01:50.5	01:34.0	03:19.0	01:20.0	03:26.0

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 AlphaAssembly.com**

STORAGE

ALPHA CVP-360 should be stored in a refrigerator upon receipt at 0 to 10 °C (32 to 50 °F). ALPHA CVP-360 should be permitted to reach room temperature before unsealing its package prior to use (see handling procedures on page 3). This will prevent moisture condensation build up in the solder paste.

CONTACT INFORMATION

**To confirm this document is the most recent version, please contact
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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 directory assistance: Chemtrec 1 - 800 - 424 - 9300.

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