

ALPHA® CVP-520

LOW MELTING POINT, NO-CLEAN, LEAD-FREE ZERO HALOGEN SOLDER PASTE

DESCRIPTION

ALPHA CVP-520 is designed to enable low temperature surface mount assembly technology. The lead-free alloy in **ALPHA CVP-520** has a melting point below 140°C, and has been successfully used with peak reflow profiles between 155°C and 190°C. The flux residue from **ALPHA CVP-520** is clear, colorless, and provides excellent electrical resistivity, exceeding industry standards.

This product enables the elimination of an extra wave or selective wave soldering process when temperature sensitive through hole components are used in an assembly. Eliminating a wave soldering or selective soldering step can significantly lower the cost of producing an electronic assembly, increase daily throughput, eliminate the need for managing bar solder and wave soldering flux supplies and eliminate the need for pallets. The carefully selected Sn/Bi/Ag alloy in **ALPHA CVP-520** was selected to give the lowest melting point, lowest pasty range during melting and re-solidification, along with a very fine grain structure, offering maximum resistance to thermal cycle based fatigue. The alloy also yields very low voiding BGA solder joints, even when a traditional SAC alloy sphere is used.

The use of **ALPHA Exactalloy**[®] performs may enable the elimination of selective wave soldering by providing additional solder volume when needed.

All components used with **ALPHA CVP-520** must be lead-free to eliminate the formation of tin/lead/bismuth intermetallic which has a melting point under 100°C.

FEATURES & BENEFITS

- Enables elimination of a second or third reflow cycle when temperature sensitive components or connectors are used.
- Reduces energy consumption in reflow ovens versus standard lead free alloys.
- Reduces reflow process cycle time.
- Delivers 8 Hour stencil life.
- Potential eliminations of bar solder, wave soldering flux and energy costs associated with wave soldering.
- Compatible with all commonly used lead free surface finishes (Entek HT; Alpha Star Immersion Silver, Immersion Tin, Ni/Au, SACX HASL, etc.)
- Excellent resistance to random solder balling minimizing rework and increasing first time yield.
- Low temperature reflow profiles may enable the use of less expensive printed circuit board substrates, when appropriate.
- Meets highest IPC 7095 voiding performance (Class III).
- Provides excellent electrical reliability properties.
- Zero halogen (no halogen intentionally added) and halide-free material.
- Compatible with either nitrogen or air reflow.





ALPHA® CVP-520

LOW MELTING POINT, NO-CLEAN, LEAD-FREE ZERO HALOGEN SOLDER PASTE

PRODUCT INFORMATION

Formulated for both standard and fine pitch stencil printing, at print speeds of between 40mm/sec (1.5"/sec) and 100mm/sec (4"/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 0.18-0.27 kg/cm of blade (1.0 -1.5 lbs/inch), depending upon the print speed. The higher the print speed employed, the higher the blade pressure that is required to prevent smearing on the stencil. Examples of successful reflow profiles are outlined below. Generally, peak temperatures of 155°C to 190°C have proven effective.

Alloys: 42%Sn/57.6%Bi/0.4%Ag (Alpha holds the appreciate license to supply this

> alloy into the United States, UK, Germany and/or Korea, as covered by the following patents (US Patents 5,569,433; Korea Patent 400121; German

Patent 69521762.3; Great Britain Patent 0711629) 42%Sn/57%Bi/1.0%Ag, available upon request

Type 3, (25-45µm per IPC J-STD-005); for printing applications Powder Size:

Type 4, (20-38µm per IPC J-STD-005); for dispense applications

Residues: Approximately 5% by (w/w) 500gram jars, 6" & 12" cartridges Packaging Sizes:

CVP-520 Flux Gel is available in 10cc and 30cc syringes for rework applications. Flux Gel:

Lead Free: Complies with RoHS Directive 2002/95/EC.

SAFETY

While the CVP-520 flux system is not considered toxic, its use in typical reflow will generate a small amount of reaction and decomposition vapors. These vapors should be adequately exhausted from the work area. Consult the SDS for all safety information. The most recent version of the SDS is available from AlphaAssembly.com.

STORAGE

CVP-520 should be stored in a refrigerator upon receipt at 0 to 10°C (32 to 50°F). CVP-520 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.





ALPHA® CVP-520

LOW MELTING POINT, NO-CLEAN, LEAD-FREE ZERO HALOGEN SOLDER **PASTE**

TECHNICAL DATA

CVP-520 TECHNICAL DATA					
CATEGORY	RESULTS	PR	OCEDURES/REMARKS		
CHEMICAL PROPERTIES					
Activity Level	ROL0 = J-STD Classification		IPC J-STD-004		
Halide Content	Halide free (by titration). Passes Ag Chromate Test	IPC J-STD-004			
Halogen Content	Pass, Zero Halogen - No halogen intentionally added	EN14582, by oxygen bomb combustion, Non detectable (ND) at < 50 ppm			
Copper Mirror Test	Pass	IPC J-STD-004			
Copper Correcion Test	Pass, (No Evidence of Corrosion)	IPC J-STD-004			
Copper Corrosion Test	Pass, (No evidence of corrosion)	JIS Z 3197 -1999 8.4.1			
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@ 5°C/85%RH)	Pass	Bellcore GR78-CORE {Pass = 1x10 ¹¹ ohm min}			
Electromigration (JIS Z 3197 @ 85°C/85%RH 48V DC 1000 hrs)	Final Reading > 10 ¹⁰ ohms No Migration After 1000 hrs =Pass	JIS Z 3197 1999			
PHYSICAL PROPERTIES (90-3 M 21 Viscosity - Malcolm viscometer @10 RPM, 25°C)					
Color	Clear, Colorless Flux Residue				
Tack Force vs. Humidity	Pass - Change of <1g/mm ² over 24 hours at 25% and 75 % RH		IPC J-STD-005		
(t = 8 hours)	Pass - Change of <10% when stored at 25±2°C and 50±10% RH		JIS Z3284 Annex 9		
Viscosity	85.3% metal loading designated M11 for dispensing. 90% metal load designated M21 for printing. 86.5% metal load, Type 4 powder designated M10 for dispense. Viscosity (Typical) 1000 poise, 10 RPM		Malcom Spiral Viscometer; J-STD-005		
Solderball	Acceptable		IPC J-STD-005		
Stencil Life	>8 hours		@ 50%RH, 23°C (74 F)		
Spread	>87%		JIS-Z-3197: 1999 8.3.1.1		
Slump	Pass		Modified IPC J-STD-005 (10 min 100°C)		
	Pass		JIS Z-3284-1994 Annex 8		



ALPHA® CVP-520

LOW MELTING POINT, NO-CLEAN, LEAD-FREE ZERO HALOGEN SOLDER **PASTE**

CVP-520 Processing Guidelines					
STORAGE & HANDLING	PRINTING	REFLOW (See Figure #1)	CLEANING		
Refrigerate to guarantee stability at 0-10°C, 32-50°F Shelf life of refrigerated paste is (6) months, Actual TBD Paste can be stored for 2 weeks at room temperature up to (25°C/77°F) prior to use	STENCIL: Recommended ALPHA CUT or ALPHA FORM stencils @ (0.100 - 0.150 mm), (4-6 mil) thick for (0.4-0.5mm) (0.016" or 0.020") pitch. Stencil design is subject to many process variables. Contact your local Alpha stencil site for advice.	ATMOSPHERE: Clean-dry air or nitrogen atmosphere. PROFILE: See Figure #1 Acceptable reflow / coalescence & IPC Class III voiding were obtained with the given profile	CVP-520 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,		
When refrigerated, allow paste container to warm to room temperature for up to four hours. Paste must be ≥ (19°C/66°F) before processing. Verify paste temperature with a thermometer to ensure paste is (19°C/66°F) or greater before set-up. Printing can be performed at temperatures up to (29°C/84°F).	SQUEEGEE: Metal (recommended) PRESSURE: (0.18-0.27) kg/cm of squeegee length (1.0-1.5 lbs/inch). SPEED: 40 - 100mm per second 1.5 to 4 inches per second.	Note: Refer to componenet and board supplier data for thermal preoperties at eleveated temperatures. Lower peak temperatures require longer TAL for improved joint cosmetics.	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		
Do not remove worked paste from stencil and mix with unused paste in jar. This will alter rheology of unused paste.	PASTE ROLL: (1.5-2.0 cm) diameter and make additions when roll reaches 1-cm, (0.4") diameter (min). Max roll size will depend upon blade. Exceeding the maximum diameter may cause curtaining (sticking to the squeegee when it is lifted from the stencil).		- ALPHA BC-2200 - Bioact™ SC-10E cleaners.		
These are starting recommendations and all process settings should be reviewed independently.	STENCIL RELEASE SPEED: 3 - 10 mm (0.12 - 0.4 inches)/ sec.				
Working conditions: 19 - 29°C on the stencil.	<u>Lift Height:</u> 8 - 14mm (0.31 - 0.55")				

Boact™ is a registered trademark of Petroferm, Inc.



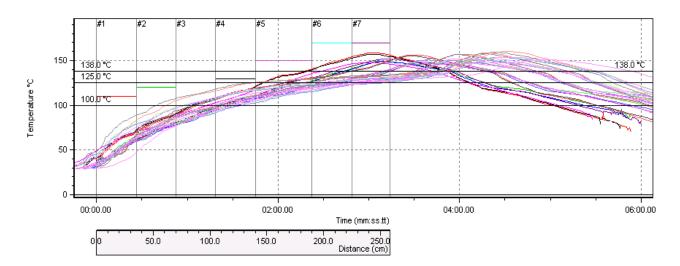


ALPHA® CVP-520

LOW MELTING POINT, NO-CLEAN, LEAD-FREE ZERO HALOGEN SOLDER PASTE

General Reflow Profile Guidelines				
Parameter	Guideline			
Atmosphere	Air or N2			
SnBiAg (42/57.6/0.4) alloy	138°C (near eutectic)			
Setting Zone	Optimal Dwell Period			
40°C to 138°C	2:10 - 4:00 minutes			
125°C to 138°C	0:30 - 1:30 minutes			
100°C to 138°C	1:15 - 2:00 minutes			
TAL (138°C)	0:30 - 1:30 minutes			
Peak temperature	155 °C - 180°C			
Joint cool down rate from 170°C	3°C - 8°C/sec			

Figure #1 - CVP-520 Reflow Profile Envelope





ALPHA® CVP-520

LOW MELTING POINT, NO-CLEAN, LEAD-FREE ZERO HALOGEN SOLDER PASTE

CONTACT INFORMATION

To confirm this is the most recent issue, please contact Alpha Assembly Solutions

AlphaAssembly.com

North America

300 Atrium Drive Somerset, NJ 08873, USA 800.367.5460

Europe

Unit 2, Genesis Business Park Albert Drive Woking, Surrey, GU21 5RW, UK 01483.758400

Asia

8/F., Paul Y. Centre 51 Hung To Road Kwun Tong, Kowloon, Hong 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 directory assistance Chemtrec 1 - 800 - 424 - 9300.

DISCLAIMER: All statements, technical information and recommendations contained herein are based on tests we believe to be reliable, but the accuracy or completeness thereof is not guaranteed. No statement or recommendation shall constitute a representation unless set forth in an agreement signed by officers of seller and manufacturer. NO WARRANTY OR MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS MADE. The following warranty is made in lieu of such warranties and all other warranties, express, implied, or statutory. Products are warranted to be free from defects in material and workmanship at the time sold. The sole obligation of seller and manufacturer under this warranty shall be to replace any product defective at the time sold. Under no circumstances shall manufacturer or seller be liable for any loss, damage or expense, direct or consequential, arising out of the inability to use the product. Notwithstanding the foregoing, if products are supplied in response to a customer request that specifies operating parameters beyond those stated above, or if products are used under conditions exceeding said parameters, the customer by acceptance or use thereof assumes all risk of product failure and of all direct, indirect and consequential damages that may result from use of the products under conditions, and agrees to exonerate, indemnify and hold harmless MacDermid Incorporated therefrom. No suggestion for product use nor anything contained herein shall be construed as a recommendation to use any product in infringement of any patent rights, and seller and manufacturer assume no responsibility or liability for any such

- ® Registered Trademark of MacDermid Performance Solutions. ™ Trademark of MacDermid Performance Solutions.
- © Platform Specialty Products Corporation and its subsidiaries 2016.

