

ALPHA[®] CVP-520 MSD-BC

Low Melting Point, Drip Resistant, No-Clean Lead-Free, Halogen-Free Solder Paste

DESCRIPTION

ALPHA CVP-520 MSD-BC is designed to enable low temperature surface mount assembly technology. The lead-free alloy in **ALPHA CVP-520 MSD-BC** has a melting point below 140 °C, and has been successfully used with peak reflow profiles between 155 °C and 190 °C. The formulation is specially tailored for the pipe printing process and does not drip and contaminate the reflow oven during the reflow process like so many other solder pastes do. The flux residue from **ALPHA CVP-520 MSD-BC** is clear & colorless.

This product enables the elimination of an extra wave or selective wave soldering process when temperature sensitive through holes 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 low temperature alloys in **ALPHA CVP-520 MSD-BC** offer 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 selected 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, especially when rectangular leads are inserted into round through holes.

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

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES & BENEFITS

- Enables pipe printing process without causing solder paste dripping and contaminating the reflow oven.
- 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 elimination 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.
- Delivers very high in-circuit pin test yields, minimizing costly false negative test results.
- Compatible with either nitrogen or air reflow.
- Possesses excellent solder drip resistance during reflow.

PRODUCT INFORMATION

Alloys: 42%Sn/57.6%Bi/0.4%Ag, SBX02
Powder Size: Type 4
Residues: Approximately 5% by (w/w)
Packaging Sizes: 500gram jars
Lead Free: RoHS Directive EU/2015/863; amending Annex II of 2011/65/EU

Note 1: For other alloys, powder size and packaging sizes, contact your local Alpha sales office.

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

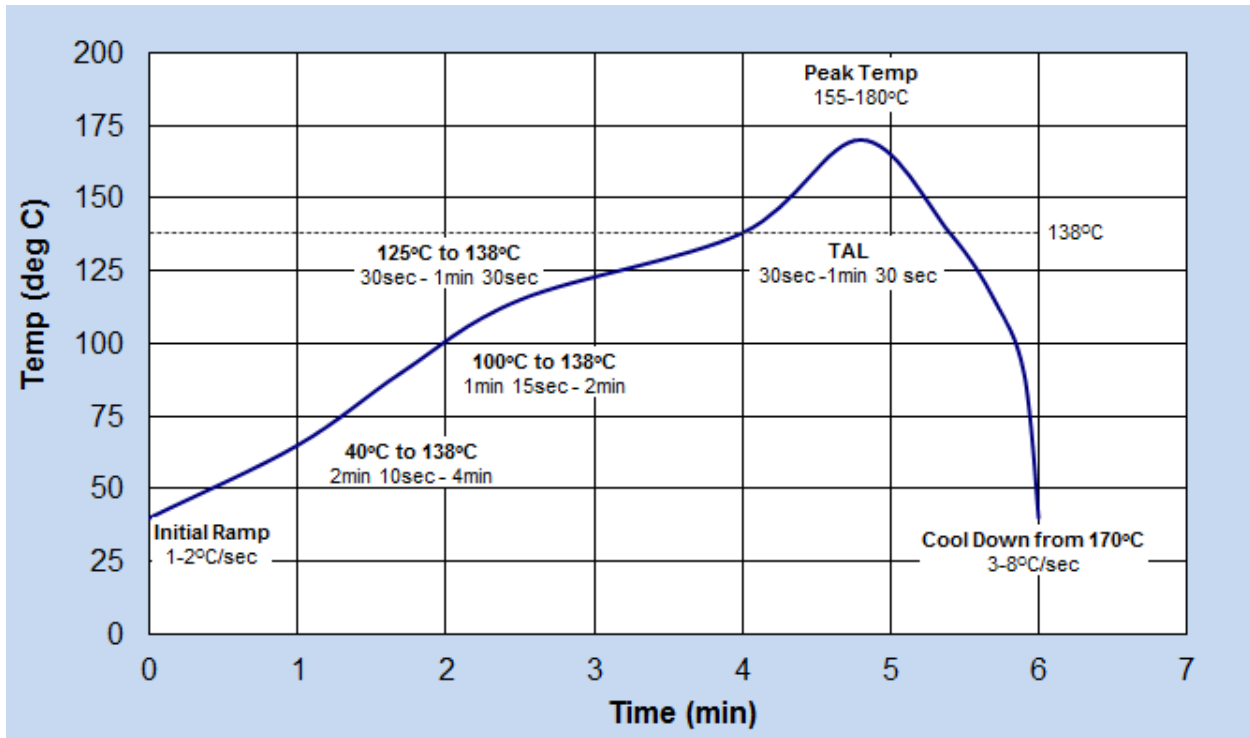
Category	Results	Procedures/Remarks
Chemical Properties		
Activity Level	ROLO	IPC J-STD-004
Halide Content	Halide free (by titration).	JIS Z 3197:2012
Copper Corrosion Test	Pass (No evidence of Corrosion)	JIS Z 3197:2012
Electrical Properties		
JIS SIR (JIS Z 3197 @ 40 °C/90% RH 168 hours)	Pass; > 10 ¹⁰ ohms	JIS Z 3197:2012
JIS Electromigration (JIS Z 3197 @ 85 °C/85% RH 45-50V DC 1000 hours)	Pass; Final Reading > 10 ⁸ ohms No Migration After 1000 hrs	JIS Z 3197:2012
Physical Properties		
Color	Clear, Colorless Flux Residue	
Viscosity	T4 metal powder load designated M10 for printing	Malcom Spiral Viscometer; IPC J-STD-005
Spread	Pass; 84.9%	JIS-Z-3197: 1999 8.3.1.1
Hot Slump	Pass; 0.4 mm	JIS Z 3284-Annex 8
Stencil Life	8 hours	50% RH, 23 °C (74 °F)

PROCESSING GUIDELINES

Storage & Handling	Printing	Reflow (See Fig. 1)	Cleaning
<ul style="list-style-type: none"> Refrigerate to guarantee stability @ 0 to 10 °C (32 to 50 °F). When stored under these conditions, the shelf life of ALPHA CVP-520 MSD-BC is 6 months from the manufacturing date. 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 at room temperature before processing. Verify paste temperature with a thermometer for at least that temperature before set up of printer. This will prevent moisture condensation build up in the solder paste. Printing can be performed at temperatures up to 32 °C (89 °F). 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. 	<p>The rheology of this product is specifically designed for the pipe printing process, facilitating sufficient volume transfer of solder paste at the through holes. The set of parameters that were successfully used during the development phase are as shown below:</p> <p><u>STENCIL:</u> This product was designed for the Pipe Printing process and not for regular stencil printing. Stencil design is subject to many process variables.</p> <p><u>SQUEEGEE:</u> HDA90 Hardness Urethane, 7mm thickness.</p> <p><u>PRESSURE:</u> 0.12 kg/cm of blade</p> <p><u>SPEED:</u> 50 mm per second</p> <p><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.</p> <p><u>STENCIL RELEASE SPEED:</u> 5 mm/sec.</p>	<p><u>ATMOSPHERE:</u> Clean-dry air or nitrogen atmosphere.</p> <p><u>PROFILE for 42%Sn/57.6%Bi/0.4%Ag & SBX02 Alloys):</u> Refer to Figure 1.</p> <p>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.</p>	<p>ALPHA CVP-520 MSD-BC residue is designed to remain on the board after reflow. If reflowed residue cleaning is required, ALPHA BC-2200 aqueous cleaner is recommended.</p> <p>For solvent cleaning, agitation for 5min in the following cleaners is recommended:</p> <ul style="list-style-type: none"> - ALPHA SM-110E - Kyzen Micronox MX2501 - ATRON AC 205 (ZESTRON) <p>Misprints and stencil cleaning may be done with:</p> <ul style="list-style-type: none"> - ALPHA SM-110E - ALPHA SM-440 - ALPHA BC-2200 - ZESTRON SD 301 cleaners.

REFLOW PROFILES

Figure 1: Typical Reflow Profile



Note 3: The processing guidelines recommended and typical reflow profile presented were tested in the lab with acceptable performance. Process optimization should still be carried out by users to determine the best process conditions for their specific application.

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.**

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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