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ALPHA® CVP-390V Solder Paste

High Electrochemical Reliability, Wide Process Window, Fine Feature Capable, Zero-Halogen, Lead-Free, No-Clean Solder Paste

DESCRIPTION

ALPHA CVP-390V is a lead-free, no-clean solder paste designed to maximize flexibility in manufacturing and provides excellent electrochemical reliability in harsh operating conditions.

ALPHA CVP-390V delivers consistent print and reflow performance across a wide range of component types. **ALPHA CVP-390V** exhibits >2.00CpK for transfer efficiencies between 60%-120% at area ratios above 0.60 against variable print process conditions for the ultimate flexibility in manufacturing. ALPHA CVP-390V maintains repeatable transfer efficiency on fine feature 01005 components and excellent coalescence down to 170µm circle and square apertures.

ALPHA CVP-390V exhibits best-in-class electrochemical reliability down to 0.100mm comb spacing against the most challenging SIR profiles. The ability to maintain high electrochemical performance in harsh operating conditions on dense assembly designs makes **ALPHA CVP-390V** ideal for high reliability applications.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES & BENEFITS

Features	Benefits
Superior electrochemical reliability	≥10^8 Ohms for 7 days on 100µm spaced modified IPC-B-24 coupons against harsh environment SIR profiles to ensure reliability on complex assemblies
Wide process window	>2.0 Cpk transfer efficiency between 60 to 120% at area ratios above 0.60 for maximum process flexibility
Reliable post reflow flux residue	Excellent pin testability to ensure highest first pass yields
Excellent reflow and coalescence	Good solderability down to 170µm apertures on high density assemblies using both ramp and soak profiles
Zero-halogen, no halogens intentionally added	Ensures RoHS compliance for a safe and environmentally friendly assembly process

PRODUCT INFORMATION

Alloy:	SAC305, Innolot
Powder Size:	Type 4, Type 5
Packaging Size:	500 gram jar, 600 gram cartridge
Lead-Free:	Complies with RoHS Directive EU/2015/863
Halogen Content:	Zero-halogen

HALOGEN STATUS

Halogen Standards			
Standard	**Requirement**	**Test Method**	**Status**
BS EN 14582:2016	Zero-halogen (not intentionally added)	SGS Halogen Cl, Br - BS EN14582(2016)/ Combustion	Not Detected
RoHS	Directive EU/2015/863 (Permissible Limit ≤1000mg/kg & ≤100mg/kg for cadmium and cadmium compounds)	IEC 62321:2013 & IEC 62321:2008	Pass
REACH	Concentrations of tested SVHC are ≤ 0.1% (w/w)	SGS In-House Method	Pass

TECHNICAL DATA

ALPHA CVP-390V		
Category	**Results**	**Procedures/Remarks**
Chemical Properties		
Activity Level	ROL0	IPC J-STD-004B
Fluoride Spot Test	No fluoride present	IPC J-STD-004B
Halogen Content Test	No Halogens detected	BS EN 14582 (2016)
Ag Chromate Test	No Halides present	JIS Z 3197
Copper Mirror test	Low activity, no breakthrough	JIS Z 3197 & IPC J-STD-004B
Copper Corrosion Test	Low activity, no corrosion	JIS Z 3197 & IPC J-STD-004B

ALPHA CVP-390V		
Category	**Results**	**Procedures/Remarks**
Electrical Properies		
Automotive Damp Heat (50V)	Pass, ≥10^8 Ohms for 6 days	IEC 6068-2-30
SIR (7 days, 40 °C/90%RH)	Pass, ≥10^8 Ohms for 7 days down to 100µm spacing	JIS Z 3197 & IPC J-STD-004B
SIR (7days, 85 °C/85%RH)	Pass, ≥10^8 Ohms for 7 days down to 100µm spacing	JIS Z 3197 & IPC J-STD-004A
SIR (7days, 85 °C/85%RH)	Pass, ≥10^8 Ohms for 7 days on BGA and MLF packages	IPC J-STD-004A
Bono Corrosion (15 days, 85 °C/85%RH)	Pass, corrosion factor (F_c) <2% for 15 days	Per Bono criteria
Electrochemical Migration	Pass, No visual evidence of corrosion, discoloration or electromigration for 596 hrs	IPC J-STD-004B
Physical Properties		
Residue Color	Clear & light amber flux residue	
Tack life	Pass, Tack force ≥100gf for minimum 24 hrs	JIS Z 3284:1994, Annex 9
Tack Life	Pass, Tack life within 80% peak for minimum 24 hrs	IPC J-STD-004B
Spread Rate	Average spread between 88 to 90%	JIS Z 3197
Stencil Life	> 8hrs consistent transfer efficiency	@25 °C/30%RH
Cold Slump (25 °C /50% RH)	Pass, no bridging above 0.20mm	IPC J-STD-005A
Hot Slump (150 °C/10min)	Pass, no bridging above 0.25mm	IPC J-STD-005A
Dryness Test (Talc)	Pass, non-sticky post reflow residue	JIS Z 3197

PROCESSING GUIDELINES

The following process settings are offered as a process window guideline based on typical SMT assembly. Due to the variation in the industry, the optimum process setting will need to be developed for each process.

Speed: Formulated for stencil printing at speeds between 25mm/s (1 in/s) and 150mm/s (6 in/sec). Optimal performance achieved at 100 to 120mm/s

Pressure: Typical blade pressures are between 0.21 Kg/cm (1.25 lbs/in) to 0.36 kg/cm (2.0 lbs/in) depending upon the print speed and quality of stencil /substrate gasket. Higher blade pressure is required to achieve a clean stencil surface for applications requiring higher print speed.

Paste Roll: Paste roll between 1.5 cm (0.60 in) to 2.0cm (0.80 in) in diameter is recommended for optimum performance with paste additions made when roll reaches 1.0 cm (0.40 in) diameter (Min). Max roll size will depend upon blade.

Squeegee: Recommend Metal Squeegee angle 60°

Stencil Release Speed: >10mm/s preferred.

For apertures with AR≥0.64 the print volumes are consistent and no prior kneading is required. For AR<0.64, paste would benefit from 1 to 2 knead strokes prior to printing.

ALPHA CVP-390V residue is designed to remain on the board after reflow. Misprint or stencil cleaning may be done with IPA.

Storage & Handling:

Note: These are starting recommendations and all process settings should be reviewed independently.

Refrigerate to guarantee stability @ 0 to 10 °C (32 to 50 °F). When stored under these conditions, shelf life of ALPHA CVP-390V is 6 months. 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 set up of printer. Paste can be stored for maximum 2 weeks at room temperature up to 25 °C (77 °F) prior to use.

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.

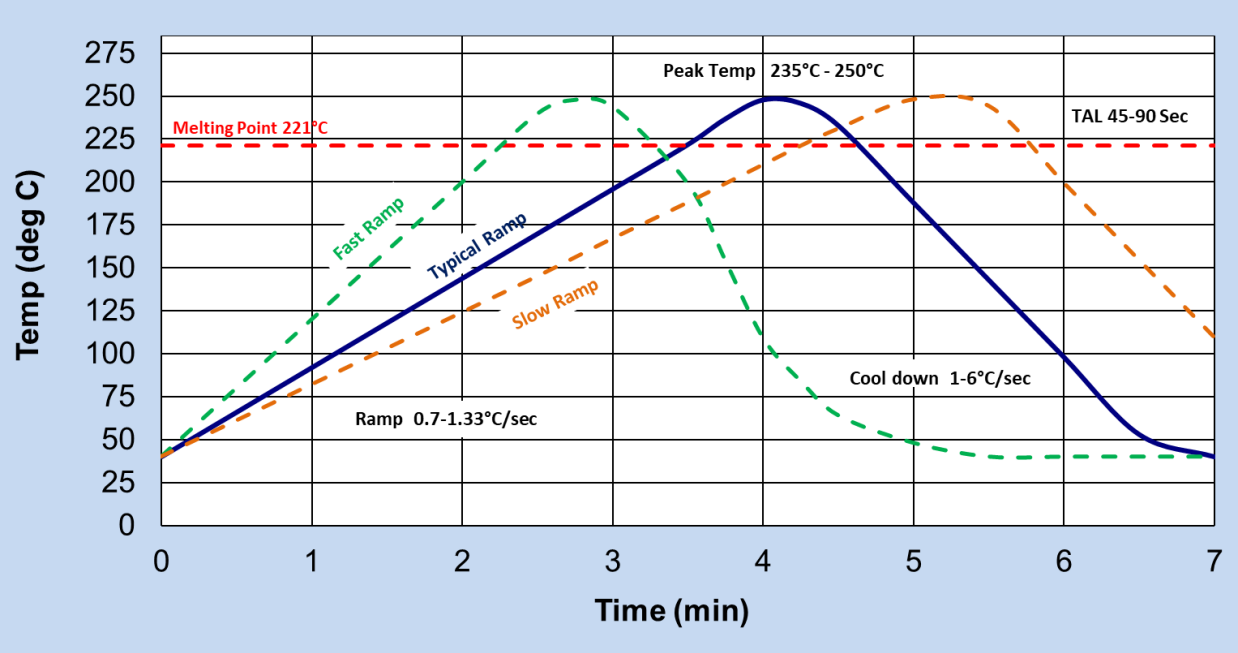
REFLOW GUIDELINES

Note: These are only recommendations. Equipment and assembly factors may require adjustments to be made to the reflow profile

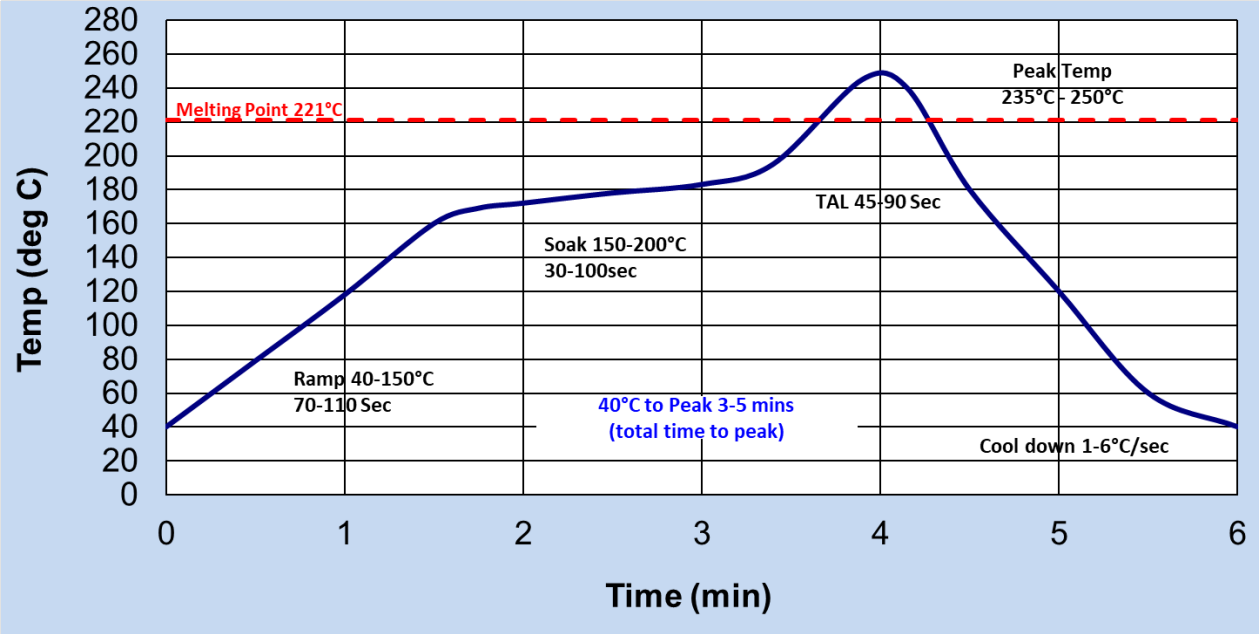
Atmosphere: Capable of reflow in Air and N_2 environments.

ALPHA CVP-390V SAC305 and Innolot Typical Reflow Profile Recommendation

Straight Ramp: SAC305 and Innolot



High Soak: SAC305 and Innolot



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

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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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