ALPHA® CVP-390V Innolot® MXE Solder Paste

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

DESCRIPTION

ALPHA CVP-390V Innolot MXE is a Next-Gen High Reliability solder paste designed to provide enhanced thermomechanical & electrochemical reliability in harsh operating conditions. This paste is designed to enable a significant increase in the thermomechanical and electrochemical reliability in high reliability assemblies while maintaining the standard industry reflow profile of 245 °C.

ALPHA CVP-390V chemistry offers superior electrochemical reliability down to 100 µm comb spacing against challenging SIR profiles. Additionally, it exhibits >2.00 CpK for transfer efficiencies between 50 to 150% at area ratios above 0.60, against variable print process conditions for the ultimate flexibility in manufacturing. The **Innolot MXE** alloy offers superior thermomechanical performance, with an increase in characteristic life up to 60%, and maintains high resistance to creep fatigue, enabling high reliability for modern day advanced electronics assemblies.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

ALLOY PROPERTIES & PERFORMANCE CAPABILITES

Property	Performance Capabilities
Excellent thermomechanical reliability	Superior thermomechanical reliability @ -40 to 125 °C and -40 to 150 °C**
High creep fatigue toughness	Exceptional resistance to creep fatigue due to advanced refined microstructure
Vibration	Exceptional vibration performance with significant increase in characteristic life over SAC305
Shear Strength	Higher residual shear strength after TCT in comparison to SAC305
Drop Shock Performance	Increased drop shock reliability for high impact low cycle testing

PASTE FEATURES & BENEFITS

Features	Benefits
Superior electrochemical reliability	≥10^8 Ohms for 7 days on 100 µm spaced modified IPC-B-24 coupons against harsh environment SIR profiles to ensure reliability on complex assemblies
Excellent reflow and coalescence	Good solderability down to 190 µm apertures on high density assemblies using both ramp and soak profiles
Enabling miniaturization	Available in T4 and T5 with >2.0 Cpk transfer efficiency between 50 to 150% at area ratios above 0.60 for maximum process flexibility
Zero-halogen, no halogens intentionally added	Ensures RoHS compliance for a safe and environmentally friendly assembly process

PRODUCT INFORMATION

Alloy:	Innolot MXE (Solidus 217 °C/Liquidus 229 °C)
Powder Size:	Type 4, Type 5
Packaging Size:	500-gram jar, 600-gram & 1200-gram cartridge
Lead-Free:	Complies with RoHS Directive EU/2015/863; amending Annex II of 2011/65/EU
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; amending Annex II of 2011/65/EU (Permissible Limit ≤1000mg/kg & ≤100mg/kg for cadmium and cadmium compounds)	IEC 62321:2013 & IEC 62321:2008	Pass

Halogen Standards			
REACH	Concentrations of SVHC are ≤ 0.1% (w/w)	Based on raw material composition information	Pass

TECHNICAL DATA

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
Electrical Properies		
Automotive Damp Heat (50V)	Pass, ≥10^8 Ohms for 6 days	IEC 6068-2-30
SIR (7 days, 85 °C/85%RH)	Pass, ≥10^8 Ohms for 7 days	JIS Z 3197 & IPC J-STD-004C
SIR (7 days, 40 °C/90%RH)	Pass, ≥10^8 Ohms for 7 days down to 100 µm spacing	JIS Z 3197 & IPC J-STD-004B
SIR (7 days, 85 °C/85%RH)	Pass, ≥10^8 Ohms for 7 days down to 100 µm spacing	JIS Z 3197 & IPC J-STD-004A
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 ≥100 gf 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

Category	Results	Procedures/Remarks
Stencil Life	8 hrs consistent transfer efficiency	@25 °C/30%RH
Cold Slump (25 °C /50% RH)	Pass, no bridging above 0.20 mm	IPC J-STD-005A
Hot Slump (150 °C/10min)	Pass, no bridging above 0.25 mm	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 general process window for typical SMT assembly. However, since each manufacturing process is unique, it is essential to develop the optimum process settings based on specific requirements.

Speed: Formulated for stencil printing at speeds between 50 mm/s (2 in/s) and 150 mm/s (6 in/s). Optimal performance achieved at 50 to 120 mm/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 on 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 1.5cm (0.60in) to 2.0 cm (0.80in) in diameter is recommended for optimum performance with paste additions made when roll reaches 1.0cm (0.40in) diameter (Min). The Maximum roll size will depend on the blade.

Squeegee: Recommend metal squeegee angle: 60°

Stencil Release Speed: >10 mm/s preferred

Some kneading may be required depending on the assembly features, such as aperture size and shape, and should be assessed per unique process.

ALPHA CVP-390V Innolot MXE 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, the shelf life of ALPHA CVP-390V Innolot MXE is 6 months. When refrigerated, warm up the 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 setting up of printer. Paste can be stored for a 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.

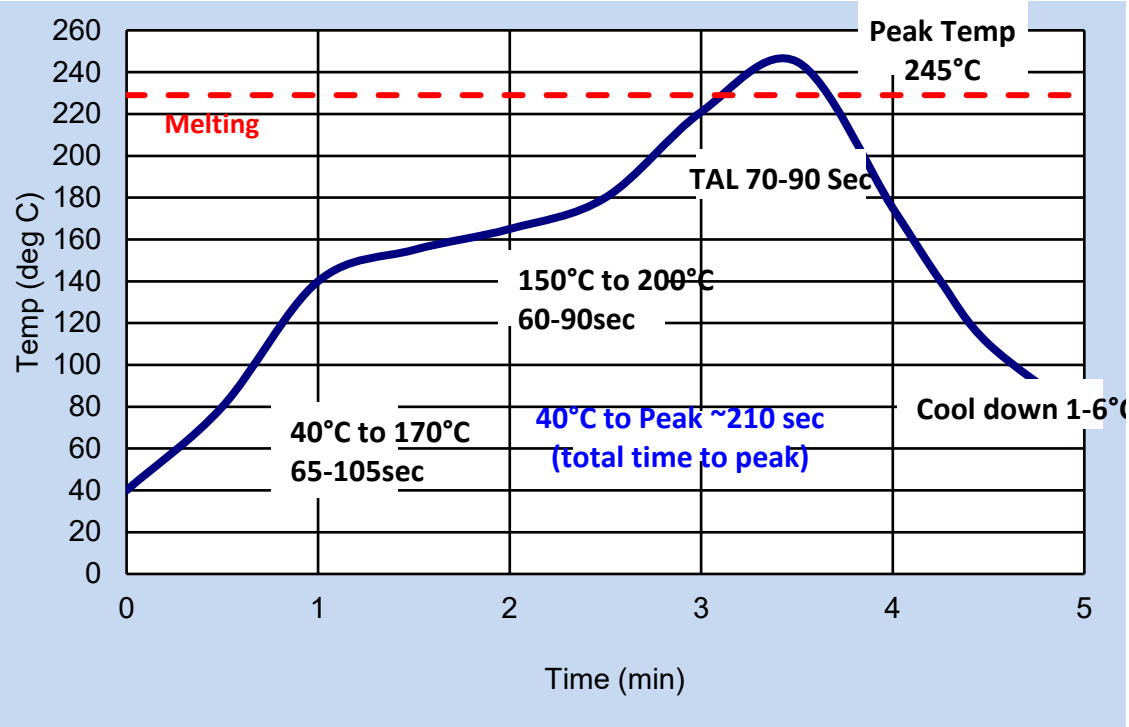
Do not remove the worked paste from stencil and mix it with unused paste in jar. This will alter the rheology of the unused paste.

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 Innolot MXE Typical Reflow Profile Recommendation



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

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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