ALPHA® VACULOY® HRL1

Low Temperature Lead Free Solder Alloy

DESCRIPTION

ALPHA Vaculoy HRL1 solder alloy is designed to enable low temperature processes. This alloy was designed to exhibit improved drop shock and thermal cycling performance versus existing low temperature alloys in the market. As with all Alpha bar solder, Alpha's proprietary Vaculoy alloying process is used to remove certain impurities, particularly oxides. This is extremely important because included oxides generate excessive drossing and increase the viscosity of the solder.

ALPHA Vaculoy HRL1 solder alloy may also be used in solid wire form in solder pot auto feed systems.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES & BENEFITS

- Enables soldering process with heat sensitive substrates, components or board materials.
- Provides efficiencies in both energy and cost versus standard lead free alloys.
- Reduction of warpage up to 99% (component and board/substrate) vs SAC305 process.
- Comparable mechanical performance with SAC305.

APPLICATION GUIDELINES

ALPHA Vaculoy HRL1 solder alloy is likely suitable for dipping and selective soldering applications for electronic assemblers interested in implementing a low temperature lead-free process. A solder pot temperature of 200°C is good starting point. However, ultimate solder pot temperature will depend on what you're soldering, and how thermally demanding the assembly is.

1. Before using ALPHA Vaculoy HRL1 solder alloy in a wave or selective soldering process, there are several important things to consider:
2. All components and PCB substrates used with ALPHA Vaculoy HRL1 solder alloy must be lead-free to eliminate the formation of tin/lead/bismuth intermetallic which has a melting point under 100 °C.
3. Because high bismuth containing low temperature solder alloys expand when they cool, any assembler using these alloys do so at their own risk.

4. Suitable liquid flux selection in low temp dipping process is crucial to ensure unburned flux residue does not result in cosmetic issue or electrical reliability issue.

5. If high boiling solvent flux is used in very low temp wave or selective soldering process (< 230 °C), solder pot contact time may need to be increased to achieve better soldering performance. Or else, increase the solder pot temperature accordingly.

For additional notes to concern during low temperature alloy in dipping process, please refer to our Reference Bulletin from our sales personnel.

TECHNICAL DATA

0.10% of Pb complies with the requirement of RoHS Directive (Article 4.1 of the European Directive 2002/95/EC). Alloy specification for maximum Lead (Pb) Content = 0.05%.

Material Property	Units	ALPHA Vaculoy HRL1
Melting Point	Celsius	138 to 151
Thermal Expansion Coefficient	(25 to 80 °C)ppm/C	20.8
Thermal Conductivity	W/mK	34.9
Tensile Strength (As Cast)	MPa	62.2

AVAILABILITY

ALPHA Vaculoy HRL1 solder alloy is available in 1kg (2.2lb) Bar and Solid Wire (> 0.5 mm).

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**

STORAGE

Store the solder bar in a cool, dry and non-corrosive environment. Wrap up the solder bar when not in use to reduce exposure to environment.

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