

ALPHA[®] HRL1 SOLDER ALLOY

Lead-Free Low Melting Temperature Alloy

DESCRIPTION

ALPHA HRL1 solder alloy is a lead-free alloy engineered to exhibit improved drop shock and thermal cycling performance versus existing low temperature alloys. This alloy offers a lower liquidus temperature than SAC based alloys allowing for lower overall assembly process temperatures and significantly reducing board warping and other high temperature process related defects like Non-Wet Opens (NWO) and Head in Pillow (HIP).

ALPHA HRL1 solder alloy complies with applicable environmental standards, including RoHS for use in products requiring the use of Pb-free material.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES AND BENEFITS

- Highly controlled manufacturing process ensures alloy purity and consistency
- Low alloy liquidus temps allows for low temperature processing
- Low temperature processing results in >90% reduction in board warpage and component damage vs. SAC alloys
- Excellent drop shock and thermal cycling performance resulting in long service life for many electronic products
- Pb-free and RoHS compliant
- Provides efficiencies in both energy and cost

APPLICATION GUIDELINES

Please refer to the appropriate ALPHA solder paste technical bulletin (where available) for specific applications guidance when using ALPHA HRL1 solder alloy in a paste form.

ALPHA HRL1 solder alloy should not be used in a wave or selective soldering application.

TECHNICAL DATA

ALPHA HRL1 solder alloy uses a proprietary alloy composition (off-eutectic Sn-Bi alloys) that demonstrate drop shock and thermal cycling performance that, under certain conditions, is comparable to SAC305 alloy.

Material Property	Units	ALPHA HRL1
Solidus Temperature	Celsius	138
Liquidus Temperature	Celsius	151
Elongation	%	40.8
Yield Strength	MPa	37.5
Ultimate Tensile Strength	(25 °C) MPa	62.2

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%.

AVAILABILITY

Please refer to the appropriate ALPHA solder paste technical bulletin (where available) for information on container configuration options when using ALPHA HRL1 solder alloy in a paste form.

ALPHA HRL1 solder alloy is also available in solid wire. Contact your MacDermid Alpha representative for available sizes.

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

Please refer to the appropriate ALPHA solder paste technical bulletin (where available) for specific storage guidance when using ALPHA HRL1 solder alloy in a paste form.

CONTACT INFORMATION

**To confirm this document is the most recent version, please contact
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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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