

Ultrapure K100LD Lead-Free Solder Alloy

Product Description

Pressure from marketing and legislation in both Europe and Asia have forced electronics manufacturers to move away from lead-based solders. Typical lead-free alloys contain 3-4% silver, which can be costly.

In addition to cost concerns, typical Tin/Silver/Copper (or SAC) alloys also present issues with increased dissolution of Copper from boards and components during the soldering process. As an example, SAC305, one of the industry's most popular lead-free wave soldering alloys, is known to dissolve Copper at a rate more than twice as fast as Sn63Pb37.

In response to demand for a low cost and low copper dissolution alloy, Kester has developed Ultrapure K100LD. K100LD is a eutectic Tin/Copper alloy with controlled metallic dopants to control the grain structure within the solder joint, and to minimize the dissolution of copper into the solder pot. K100LD virtually eliminates the occurrence of common defects such as icling and bridging. The improved grain structure also results in shinier solder joints than traditional lead-free alloy alternatives.

The accelerated rate of Copper dissolution has caused difficulties for electronic assemblers due to Copper terminal erosion and also elevated Copper levels in wave soldering pots. In particular, the elevated Copper levels in wave soldering pots can make the alloy flow more sluggishly, creating additional defects if the solder pot is not carefully controlled.

K100LD compares favorably to other low-cost, lead-free alloys of tin and copper in terms of wetting and flow characteristics.

- Low cost, lead-free alloy
- Bright, smooth solder joints with no visible shrinkage effects
- Excellent through-hole penetration and topside fillet
- Eutectic alloy
- Low dissolution of copper from boards and components into solder pot
- Less corrosive to solder pots than SAC305
- 20% Lower dross rate than Sn63Pb37 in laboratory tests

Pot Maintenance

Kester's Solder Analysis Program (Option C) should be utilized periodically to verify composition and purity. If the concentration of Copper increases beyond 0.85%, it is recommended to top-off the solder pot with 100% tin.

Process Information

Suitable for wave, selective and dip tinning operations. Use Kester fluxes 979, 959T, 2220-VF, 2235 for optimum wave soldering. Pot temperatures range for wave and dip tinning is 260 to 270 °C.

Maximum Allowed Impurities

Ultrasure meets the requirements of current industry standards for allowable impurity requirements.

Element	J-STD-006C	K100LD
Gold	0.050	0.050
Antimony	0.200	0.200
Cadmium	0.002	0.002
Zinc	0.003	0.003
Aluminum	0.005	0.005
Iron	0.020	0.020
Arsenic	0.030	0.030
Silver	0.100	0.100
Indium	0.100	0.100
Lead	0.050	0.050

Ultrasure will conform to these requirements when purchased directly or through stocking distributors. Kester is the only manufacturer of Ultrasure quality solder. Ultrasure conforms to the requirements of J-STD-006C formerly QQ-S-571F. DOD-STD-2000-1A (Soldering Technology, High Quality/High Reliability) states that it is the responsibility of the manufacturer to select those materials and processes that will produce acceptable high quality/high reliability products.

Physical Properties

Melting Temperature	~227 °C (441 °F)
Tensile Strength	3 2 MPa (4600 psi)
Thermal Conductivity	64 W/m-K
Electrical Resistivity	13 µΩ-cm

Storage, Handling and Shelf Life

Storage must be in a dry, non-corrosive environment between 10 to 40 °C (50 to 104 °F). The surface may lose its shine and appear a dull shade of grey. This is a surface phenomenon and is not detrimental to product functionality. Solder bar has a limited warranty period determined by the alloy used in the bar. For alloys containing more than 70% lead, the warranty period is 2 years from the date of manufacture. Other alloys have a warranty period of 3 years from the date of manufacture.

Health and Safety

This product, during handling or use, may be hazardous to your health or the environment. Read the Safety Data Sheet and warning label before using this product. Safety Data Sheets are available at <https://www.kester.com/downloads/sds>.

Contact Information

To confirm this document is the most recent version, please contact Assembly@MacDermidAlpha.com

North America 800 West Thorndale Avenue Itasca, IL USA 60143 Phone: +1 800.2.KESTER	Asia Pacific 61 Ubi Avenue 1 #06-01 UB Point Singapore 408941 Phone: +65 6.449.1133	Europe Ganghofer Strasse 45 82216 Gernlinden, Germany Phone: +49 (0) 8142 4785 0
---	--	--

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

DISCLAIMER: All statements, technical information and recommendations contained herein are based on tests we believe to be reliable, but the accuracy or completeness thereof is not guaranteed. No statement or recommendation shall constitute a representation unless set forth in an agreement signed by officers of seller and manufacturer. NO WARRANTY OF MERCHANTABILITY, WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY IS MADE. The following warranty is made in lieu of such warranties and all other warranties, express, implied, or statutory. Products are warranted to be free from defects in material and workmanship at the time sold. The sole obligation of seller and manufacturer under this warranty shall be to replace any noncompliant product at the time sold. Under no circumstances shall manufacturer or seller be liable for any loss, damage or expense, direct, indirect, incidental or consequential, arising out of the inability to use the product. Notwithstanding the foregoing, if products are supplied in response to a customer request that specifies operating parameters beyond those stated above, or if products are used under conditions exceeding said parameters, the customer by acceptance or use thereof assumes all risk of product failure and of all direct, indirect, incidental and consequential damages that may result from use of the products under such conditions, and agrees to exonerate, indemnify, defend and hold harmless MacDermid, Incorporated and its affiliates therefrom. No suggestion for product use nor anything contained herein shall be construed as a recommendation to use any product in a manner that infringes any patent or other intellectual property rights, and seller and manufacturer assume no responsibility or liability for any such infringement.

© 2019 MacDermid, Inc. and its group of companies. All rights reserved. "®" and "TM" are registered trademarks of MacDermid, Inc. and its group of companies in the United States and/or other countries.