

278 Flux-Cored Wire with Innolot Alloy

Halogen-Free, Halide-Free, No-Clean Cored Wire for High Performance Applications

Product Description

Kester 278 Flux-Cored Wire is a halogen-free wire optimized for high performance applications, such as under-the-hood automotive. 278, with its fast wetting and low spattering, performs admirably when benchmarked against conventional halogen/halide-based systems, enabling its use in drag soldering and minimizing cycle time in robotic and manual soldering. The use of 278 results in a clear post-soldering residue without the need for cleaning. 278 is classified as Type ROL0 flux under J-STD-004B specifications. 278 is halogen-free and halide-free, conforming to the strictest requirements of IEC 61249-2-21, JPCA-ES-01 and IPC-410B specifications.

Performance Characteristics:

- Very low flux spatter
- Excellent wetting speed; superior to halogenated materials
- Conforms to halogen-free requirement of IEC 61249-2-21, JPCA-ES-01 and IPC-410B specifications
- Low smoke and odor
- Clear, non-tacky residue, resulting in excellent joint aesthetics after soldering and ease of inspection
- Excellent surface wettability and spreading suitable for robotic and manual soldering
- Excellent manufacturing consistency and uniform quality, minimizes defects for all types of soldering
- Classified as ROL0 per J-STD-004B

Reliability demands on electronic assemblies are becoming increasingly more challenging with the rapid evolution of the automotive industry. A combination of extreme environmental stresses, challenging customer warranty demands, and increased component performance requirements creates the need for optimized solutions. Innolot solder alloy was designed to meet those increasingly challenging needs. The resultant microstructure of an Innolot solder joint addresses thermal fatigue challenges facing products designed for high temperature, high vibration environments. The creep resistance and tensile strength of the Innolot alloy enhances reliability beyond the capabilities of standard SAC alloys.

Key Attributes:

- Solder joint reliability for applications with peak temperatures as high as 150 °C
- Improved thermal management due to inherent creep resistance properties
- Improved performance in harsh environment applications such as under-the-hood automotive, Advanced Safety Devices (ADAS), high power LED and avionics/aerospace
- Reflow at temperatures equivalent to SAC305

RoHS Compliance

This product meets the requirements of the Restriction of Hazardous Substances (RoHS) Directive. Additional RoHS information is located at <https://www.kester.com/downloads/environmental>.

Reliability Properties**Copper Mirror Corrosion:** Low

Tested to J-STD-004B, IPC-TM-650, Method 2.3.32

Corrosion Test: Low

Tested to J-STD-004B, IPC-TM-650, Method 2.6.15

Silver Chromate: Pass

Tested to J-STD-004B, IPC-TM-650, Method 2.3.33

Chloride and Bromides: None

Tested to J-STD-004, IPC-TM-650, Method 2.3.35

Fluorides by Spot Test: Pass

Tested to IPC-TM-650, Method 2.3.35.1

Surface Insulation Resistance (SIR) 40 °C/90% RH, IPC (typical): Pass

Tested to J-STD-004B, IPC-TM-650, Method 2.6.3.7

Surface Insulation Resistance (SIR), IPC (typical): Pass

Tested to J-STD-004, IPC-TM-650, Method 2.6.3.3

Test Conditions: 85 °C, 85% RH, 7 days, 100V

Surface Insulation Resistance (SIR): Pass

Tested to J-STD-004A, IPC-TM-650, Method 2.6.3.3

Test Conditions: 85 °C/185 °F, 85% RH, 7 days, 100V

	Blank	278
Day 1	$9.6 \times 10^{10} \Omega$	$6.5 \times 10^8 \Omega$
Day 4	$9.5 \times 10^{10} \Omega$	$7.9 \times 10^8 \Omega$
Day 7	$8.5 \times 10^{10} \Omega$	$8.7 \times 10^8 \Omega$

Availability

278 is available in Innotot lead-free alloy at 2.2% flux in wire diameters of 0.5 mm (0.020 in) on a 100 g spool, or 0.8 mm (0.031 in) and 1.0 mm (0.040 in) on a 250 g spool. For details, please contact Kester Customer Service. Please refer to <https://www.kester.com/> for more information.

Process Guidelines

Solder iron tip temperatures are most commonly between 371 to 400 °C (700 to 750 °F) for lead-free alloys. Heat both the land area and component lead to be soldered with the iron tip prior to applying the solder wire to land area or component lead. In order to maximize tip life and reduce solder spattering, do not feed wire directly to iron tip.

Additional liquid flux should only be used as a last resort. Any flux applied to the solder location should be kept to the area of the connection being reworked. If needed, Kester NF372-TB Liquid Flux may be used as a compatible liquid flux to aid in enhancing solderability of soldered joints. NF372-TB Liquid Flux is also available in Flux-Pens[®] for optimum board cleanliness.

All electronic components used with Innotot solder alloy must be lead-free to prevent the formation of a tin-lead-bismuth intermetallic, which has a melting point lower than 100 °C (212 °F).

Cleaning

278 possesses excellent fluxing ability. The flux residues are non-corrosive, non-conductive, and do not require removal for most applications under normal conditions of use. IPA will not clean the residues off the surface of the circuit board after the soldering process. If removal is required, a saponifier or cleaning agent specifically designed to clean a no-clean flux is required to clean the residues. Please contact Kester Technical Support for further information.

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. Flux-cored solder wire has a limited warranty period determined by the alloy used in the wire. 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 8/F., Paul Y. Centre 51 Hung To Road Kwun Tong, Kowloon, Hong Kong Phone: +852.3190.3100	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 "™" are registered trademarks of MacDermid, Inc. and its group of companies in the United States and/or other countries.