

## 278 Flux-Cored Wire with Innolot Alloy

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

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### 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

	Blank	278
Day 1	9.6*10 <sup>10</sup> Ω	6.5*10 <sup>8</sup> Ω
Day 4	9.5*10 <sup>10</sup> Ω	7.9*10 <sup>8</sup> Ω
Day 7	8.5*10 <sup>10</sup> Ω	8.7*10 <sup>8</sup> Ω

**Availability**

278 is available in Innolot 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 Innolot 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 shelf life determined by the alloy used in the wire. For alloys containing more than 70% lead, the shelf life is 2 years from the date of manufacture. Other alloys have a shelf life 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](mailto: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

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