

# 979 Soldering Flux

## VOC-free, No-Clean, Liquid Flux

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### Product Description

Kester 979 Soldering Flux is a VOC-free, no-clean flux formulation for high quality, low-defect soldering of electronic circuit board assemblies. This flux's finely tuned activation system offers the best wetting available in VOC-free liquid flux technology and the shiniest solder joints. 979 also reduces micro solder balling on glossy laminates and between connector pins. 979 will not attack properly cured solder masks or FR-4 Epoxy-Glass laminate. 979 leaves a minimal amount of residue after soldering. All remaining residues are non-corrosive, non-conductive and do not need to be removed

Note: Not recommended for use in a soldering process that does not have a preheat cycle associated with it. For example, this will not work well with a soldering iron.

### Performance Characteristics:

- Biodegradable at pH of 2.0 or greater
- Chemically compatible with most solder masks and board laminates
- Does not degrade Surface Insulation Resistance
- No offensive odors
- Bright, shiny solder connections
- Classified as ORL0 per J-STD-004
- Compliant to Bellcore GR-78

### RoHS Compliance

This product meets the requirements of the Restriction of Hazardous Substances (RoHS) Directive, 2011/65/EU for the stated banned substances.

### Physical Properties

**Specific Gravity:**  $1.020 \pm 1.010$

Anton Paar DMA 35 @ 25 °C

**Percent Solids (theoretical):** 4.5%

Tested to J-STD-004, IPC-TM-650, Method 2.3.34

**Acid Number (typical):**  $40.0 \pm 3.0$  mg, KOH/g of flux

Tested to J-STD-004, IPC-TM-650, Method 2.3.13

**Thinner:** DI Water

## Reliability Properties

**Copper Mirror Corrosion:** Low

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

**Corrosion Test:** Low

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

**Silver Chromate:** Pass

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

**Chloride and Bromides:** None Detected

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

**Fluorides by Spot Test:** Pass

Tested to J-STD-004, IPC-TM-650, Method 2.3.35.1

**Surface Insulation Resistance (SIR):** Pass

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

	Blank	979 PD	979 PU
Day 1	$2.8 \times 10^{10} \Omega$	$1.9 \times 10^{10} \Omega$	$2.3 \times 10^{10} \Omega$
Day 4	$1.5 \times 10^{10} \Omega$	$1.1 \times 10^{10} \Omega$	$1.2 \times 10^{10} \Omega$
Day 7	$1.2 \times 10^{10} \Omega$	$9.1 \times 10^9 \Omega$	$9.6 \times 10^9 \Omega$

## Flux Application

979 can be applied to circuit boards by a spray or dip process. Flux deposition should be 120 to 240  $\mu\text{gr}$  of solids/ $\text{cm}^2$  (750 to 1500  $\mu\text{gr}$  of solids/ $\text{in}^2$ ). An air knife after the flux tank in the dip application is recommended to remove excess flux from the circuit board and prevent dripping on the preheated surface.

Note: Will not work in a foam application.

## Process Considerations

The optimum preheat temperature for most circuit assemblies is 95 to 115 °C (203 to 239 °F) as measured on the top or component side of the printed circuit board. Dwell time in the wave is typically 2 to 4 seconds for leaded alloys and 4-8 seconds for lead-free alloys. The wave soldering speed should be adjusted to accomplish proper preheating and evaporate excess water, which could cause splattering. For best results, speeds of 1.1 to 1.8 m/min (3.5 to 6 ft/min) are used. The surface tension has been adjusted to help the flux form a thin film on the board surface allowing rapid water evaporation.

## Elimination of Splattering

Since VOC-free fluxes are water-based, splattering can be a problem. Splattering occurs when water comes in contact with molten solder, so it may be necessary to use forced air to drive off the water. Manufacturers have reported that blowing hot air at 0.28 to 0.85 m<sup>3</sup>/hr (10 to 30 ft<sup>3</sup>/hr) greatly assists in drying the water off the circuit boards. For this reason, it is suggested that 979 be used in a soldering process that has a preheat cycle associated with the soldering application.

## Flux Control

Acid number is normally the most reliable method to control the flux concentration of low solids, no-clean fluxes. Evaporative loss is minimal because this flux is water-based. To check concentration, a simple acid-base titration should be used. PS-22 Test Kit and procedure are available from Kester. The thinner for this flux is DI water.

## Cleaning

979 flux residues are non-conductive, non-corrosive that does not require removal in most applications. If residue removal is required, plain DI water at 43 to 54 °C (110 to 130 °F) with a Saponifier is required.

## Recycling Services

We provide safe and efficient recycling services to help companies meet their environmental and legislative requirements and at the same time, maximize the value of their waste streams.

Our service collects solder dross, solder scrap, and various forms of solder paste waste. Please contact your local sales representative for recycling capabilities in your area or [link here](#).



## Storage, Handling and Shelf Life

Shelf-life is 1 year from date of manufacture when handled properly and held at 4 to 25 °C (40 to 77 °F). The appearance will naturally darken over time from clear, colorless to yellow / slight amber color.

Because this formulation is water-based it is subject to freezing. A minimum storage temperature of 4°C (40°F) is recommended. If frozen, 979 is easily reconstituted by stirring at room temperature.

## 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 this [link](#).

## Contact Information

To confirm this document is the most recent version, please contact [Assembly@MacDermidAlpha.com](mailto:Assembly@MacDermidAlpha.com)

<b>North America</b> 109 Corporate Blvd. South Plainfield, NJ 07080, USA 1.800.253.7837	<b>Europe</b> Unit 2, Genesis Business Park Albert Drive Woking, Surrey, GU21 5RW, UK 44.01483.758400	<b>Asia Pacific</b> 8/F., Paul Y. Centre 51 Hung To Road Kwun Tong, Kowloon, Hong Kong 852.3190.3100
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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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