



## 979VT Soldering Flux

### VOC-free No-Clean Low Solids Liquid Flux for Lead-bearing and Lead-free Applications

#### Product Description

Kester 979VT is a VOC-free, no-clean flux formulation for high quality, low-defect soldering of lead-free 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. 979VT also reduces micro-solderballing on glossy and matte laminates and between connector pins. 979VT will not attack properly cured solder masks or FR-4 Epoxy-Glass laminate. It has been specially formulated to accommodate needs of single sided board assemblers. 979VT leaves no haze or visible residue behind, including the white powdery residue associated with use of earlier no-clean formulas. The minuscule amount of non-visible residue that remains after soldering is non-conductive, non-corrosive, and does not need to be removed.

#### Performance Characteristics:

- Biodegradable at pH of 2.0 or greater
- Chemically compatible with most solder masks and board laminates
- No surface insulation degradation
- 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:** 1.014 ± 0.005  
Anton Paar DMA 35 @ 25°C

**Acid Number:** 43.0 ± 3.5mg KOH/g  
of flux  
Tested to J-STD-004, IPC-TM-650, Method 2.3.13

**pH (5% solution, typical):** 3.2  
Mettler-Toledo MA235 pH/Ions Analyzer @ 25°C

**Percent Solids (typical):** 5%  
Tested to J-STD-004, IPC-TM-650, Method 2.3.34

#### Reliability Properties

**Copper Mirror Corrosion:** Low  
Tested to J-STD-004, IPC-TM-650, Method 2.3.32

**Silver Chromate:** Pass  
Tested to J-STD-004, IPC-TM-650, Method 2.3.33

**Surface Insulation Resistivity (SIR),  
IPC (typical):** Pass  
Tested to J-STD-004, IPC-TM-650, Method 2.6.3.3

**Corrosion Test:** Low  
Tested to J-STD-004, IPC-TM-650, Method 2.6.15

**Chloride and Bromides:** 0%  
Tested to J-STD-004, IPC-TM-650, Method 2.3.35

**Surface Insulation Resistivity (SIR),  
Bellcore (typical):** Pass  
Tested to Bellcore GR-78-Core

**Fluorides by Spot Test:** Pass  
Tested to J-STD-004, IPC-TM-650, Method 2.3.35.1

	Blank	979VT PU	979VT PD
Day 1	1.7*10 <sup>10</sup> Ω	5.0*10 <sup>9</sup> Ω	1.7*10 <sup>9</sup> Ω
Day 4	1.9*10 <sup>10</sup> Ω	1.1*10 <sup>10</sup> Ω	1.9*10 <sup>9</sup> Ω
Day 7	1.8*10 <sup>10</sup> Ω	1.1*10 <sup>10</sup> Ω	3.8*10 <sup>9</sup> Ω

## Flux Application

979VT can be applied to circuit boards by a spray or dip process. It is not designed for a foam application. Flux deposition should be 120-240  $\mu\text{gr}$  of solids/ $\text{cm}^2$  (750-1500  $\mu\text{gr}$  of solids/ $\text{in}^2$ ).

## Process Considerations

The optimum preheat temperature for most circuit assemblies is 110-155°C (230-311°F), as measured on the top or component side of the assembly. Dwell time in the wave is typically 3-5 seconds for Sn63Pb37 and 4-8 seconds for lead-free alloys. The wave soldering conveyor speed should be adjusted to accomplish proper contact time for the alloy in the solder pot then the heaters in the preheat section adjusted to meet the requirements for the top side circuit board temperature.

## 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. Kester PS-22 is required for incoming inspection. Being a water-based flux it is not a flux recommended for a foam application. The thinner for this flux is DI water.

## Cleaning

979VT flux residues are non-conductive, non-corrosive and do not require removal in most applications. If residue removal is required, plain DI water at 43-54°C (110-130°F) may be used.

## Storage and Shelf Life

Because this formulation is water-based, it is subject to freezing. A minimum storage temperature of 4°C (40°F) is recommended. If frozen, 979VT is easily reconstituted by stirring at room temperature. Shelf life is 1 year from the date of manufacture when handled properly and held at 4-25°C (40-77°F). 979VT will sometimes exhibit fluid darkening while in storage in its original container 8-12 weeks or longer after manufacture date. This flux in the container may change from a clear fluid to a light brown fluid. This is a normal change and does not affect the performance of 979VT.

## Health and Safety

This product, during handling or use, may be hazardous to your health or the environment. Read the Safety Data Sheet (SDS) and warning label before using this product.