

# 959

## Low-Solids No-Clean Liquid Flux

### Product Description

Kester 959 is a no-clean, non-corrosive, liquid flux that is designed for the wave soldering of conventional and surface mount circuit board assemblies. Kester 959 was developed to minimize the formation of micro-solderballs during wave soldering operations. This flux contains a small percentage of rosin (1%), which improves solderability, heat stability and surface insulation resistance. Kester 959 offers the best wetting and the shiniest solder joints of any no-clean, solvent-based chemistry. Kester 959 leaves evenly distributed residues for the best cosmetic appearance.

#### Performance Characteristics:

- Minimize micro-solderballs
- Extremely shiny joints
- No streaky, white residues
- Improves soldering performance
- Eliminates the need and expense of cleaning
- Classified as ORL0 per J-STD-004
- Compliant to Bellcore GR-78

### RoHS Compliance

This product meets the requirements of the RoHS (Restriction of Hazardous Substances) Directive, 2002/95/EC Article 4 for the stated banned substances.

### Physical Properties

**Specific Gravity:** 0.810 ± 0.005

Antoine Paar DMA 35 @ 25°C

**Percent Solids (typical):** 3.9

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

**Acid Number:** 21.8 ± 1.5 mg KOH/g of flux

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

**pH (10% solution):** 4.6

Hanna Instruments 8314 @ 25°C

**Thinner:** 4662

### 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

**SIR, IPC (typical):** Pass

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

	<b>Blank</b>	<b>959 PD</b>	<b>959 PU</b>
Day 1	2.7 × 10 <sup>10</sup> Ω	2.4 × 10 <sup>10</sup> Ω	2.4 × 10 <sup>10</sup> Ω
Day 4	1.5 × 10 <sup>10</sup> Ω	1.5 × 10 <sup>10</sup> Ω	1.4 × 10 <sup>10</sup> Ω
Day 7	1.2 × 10 <sup>10</sup> Ω	1.2 × 10 <sup>10</sup> Ω	1.1 × 10 <sup>10</sup> Ω

## Application Notes

### Flux Application:

Kester 959 can be applied to circuit boards by a spray, foam or dip process. Flux deposition should be 120-240  $\mu\text{g}$  of solids/ $\text{cm}^2$  (750-1500  $\mu\text{g}$  of solids/ $\text{in}^2$ ). An air knife after the flux tank is recommended to remove excess flux from the circuit board and prevent dripping on the preheater surface.

### Process Considerations:

The optimum preheat temperature for most circuit assemblies is 90-105°C (194-221°F) as measured on the top or component side of the printed circuit board. Dwell time in the wave is typically 2-4 seconds. The wave soldering speed should be adjusted to accomplish proper preheating and evaporate excess solvent, which could cause spattering. For best results, speeds of 1.1-1.8 m/min (3½-6 ft/min) are used. The surface tension has been adjusted to help the flux form a thin film on the board surface allowing rapid solvent evaporation.

### Flux Control:

Acid number is normally the most reliable method to control the flux concentration of low solids, no clean fluxes. To check concentration, a simple acid-base titration should be used. PS-20 Test Kit and procedure are available from Kester. Control of the flux in the foam flux tank during use is necessary for assurance of consistent flux distribution on the circuit boards. The complex nature of the solvent system for the flux makes it imperative that Kester 4662 Thinner be used to replace evaporative losses. When excessive debris from circuit boards, such as board fibers and from the air line build up in the flux tank, these particulates will re-deposit on the circuit boards which may create a build up of residues on probe test pins. It is, therefore, necessary to clean the tank and then replenish it with fresh flux when excessive debris accumulates in the flux tank.

### Cleaning:

Kester 959 flux residues are non-conductive, non-corrosive and do not require removal in most applications.

### Storage and Shelf Life:

Kester 959 is flammable. Store away from sources of ignition. Shelf life is 2 years from date of manufacture when handled properly and held at 10-25°C (50-77°F).

### Health & Safety:

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

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