kester®
CONNECTING INNOVATION™

951
Low-Solids No-Clean Liquid Flux

Product Description

Kester 951 is a halogen-free, non-rosin organic flux designed for wave soldering conventional and surface mount circuit board assemblies. The extremely low solids content (2.0%) and nature of the activator system results in practically NO RESIDUE left on the assembly after soldering. Boards are dry and cosmetically clean as they exit the wave solder machine. There are no residues to interfere with electrical testing. Kester 951 exhibits improved soldering performance to minimize solder bridges (shorts) and excessive solder defects. This flux is suitable for automotive, computer, telecommunications and other applications where reliability considerations are critical. The surface insulation resistance on soldered boards is higher than that provided by typical organic water-soluble fluxes. Kester 951 contains a corrosion inhibitor such that no corrosion products are formed when bare copper surfaces are exposed to humid environments.

Performance Characteristics:

- Improves soldering performance
- Eliminates the need and expense of cleaning
- Non-corrosive tack-free residues
- Classified as ORL0 per J-STD-004
- Compliant to Bellcore GR-78

Physical Properties

Specific Gravity: 0.814 ± 0.003
Antoine Paar DMA 35 @ 25°C

Percent Solids (typical): 2.0
Tested to J-STD-004, IPC-TM-650, Method 2.3.34

Acid Number: 14.3 ± 0.7 mg KOH/g of flux
Tested to J-STD-004, IPC-TM-650, Method 2.3.13

pH (10% solution): 3.4
Hanna Instruments 8314 @ 25°C

Flash Point: 16°C (60°F)

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

	Blank	951 PD	951 PU
Day 1	$2.3 \times 10^{10}\ \Omega$	$9.4 \times 10^{9}\ \Omega$	$8.2 \times 10^{9}\ \Omega$
Day 4	$1.3 \times 10^{10}\ \Omega$	$7.8 \times 10^{9}\ \Omega$	$7.5 \times 10^{9}\ \Omega$
Day 7	$9.8 \times 10^{9}\ \Omega$	$6.3 \times 10^{9}\ \Omega$	$5.8 \times 10^{9}\ \Omega$

Application Notes

Flux Application:

Kester 951 can be applied to circuit boards by a spray, foam or dip process. Flux deposition should be 120-240 µg of solids/cm² (750-1500 µg of solids/in²). 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 93-110°C (200-230°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-22 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 110 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 redeposit 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 951 flux residues are non-conductive, non-corrosive and do not require removal in most applications. If residue removal is required, call Kester Technical Support.

Storage and Shelf Life:

Kester 951 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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