

R593 Water-Soluble Solder Paste

Product Description

Kester R593 is an organic acid, water soluble solder paste formula specifically designed to exhibit long stencil life/print life. R593 maintains its activity and printing characteristics for up to 8 hours. R593 exhibits excellent printing characteristics over a wide range of relative humidity conditions encountered in different working environments. R593 is classified as Type ORM0 flux under IPC ANSI/J-STD-004 Joint Industry Standard. This paste was formerly classified as Type WSF-1 per QQ-S-571.

- Halide free chemistry
- Stencil Life: 8 hours (process dependent)
- Excellent printing characteristics to 0.4mm (16 mil) pitch
- Longer tack life
- Leaves bright/shiny solder joints after reflow
- Scrap is reduced due to less paste dry out
- Residues easily removed with DI water
- Can reflow in air or nitrogen
- Elimination of CFC solvent cleaners
- Classified as ORM0 per J-STD-004

Standard Applications

90% Metal -- Stencil Printing

Physical Properties

(Data given for Sn63/Pb37 and Sn62/Pb36/Ag02, 90% metal, -325+500 mesh)

Viscosity (typical): 1000 kcps Brookfield RV-DVII+, TF Spindle, 5 RPM, 25°C, 1.0" Spindle Depth

Initial Tackiness (typical): 1.9 grams/mm² force Tested to J-STD-005, IPC-TM-650, Method 2.4.44

Slump Test: Pass Tested to J-STD-005, IPC-TM-650, Method 2.4.35

Solder Ball Test: Preferred Tested to J-STD-005, IPC-TM-650, Method 2.4.43

pH (5% solution, typical): 3.5 Mettler-Toledo MA235 pH/lons Analyzer at paste flux level

Water Extract Resistivity (typical):

156,000 Ω -cm Tested with raw flux

Reliability Properties

Copper Mirror Corrosion: Moderate 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 Bromide (typical): <0.002% 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

S.I.R., IPC (typical): Pass

Tested to J-STD-004, IPC-TM-650, Method 2.6.3.3		
	<u>Blank</u>	<u>R593</u>
Day 7(168 h)	8.9 x 10 ⁹ Ω	2.8 x 10 ⁸ Ω

Application Notes

Availability:

Kester R593 is commonly available in the Sn63Pb37 alloy and Sn62Pb36Ag02 alloys. Type 3 powder mesh is recommended, but different powder particle size distributions are available for standard and fine pitch applications. For specific packaging information, see Kester's Solder Paste Chart for available sizes. The appropriate combination depends on process variables and the specific application.

Printing Parameters:

Squeegee Blade Squeegee Speed Stencil Material Temperature / Humidity 80 to 90 durometer polyurethane or stainless steel 15 to 40 mm/sec (0.6-1.6 in/sec) recommended Stainless Steel, Molybdenum, Nickel Plated, Brass Optimal ranges are 21-25°C (70-77°F) and 35-65% RH

Recommended Reflow Profile:

The recommended convection reflow profile for R576-8 formula made with either the Sn63Pb37 or Sn62Pb36Ag02 is shown here. This profile is simply a guideline. Since R593 is a highly active, water-soluble solder paste, it can solder effectively over a wide range of profiles. Your optimal profile may be different from the one shown based on your oven, board and mix of defects. Please contact Kester if you need additional profiling advice.



Cleaning:

R593 residues are best removed using automated cleaning equipment (in-line or batch). De-ionized water is recommended for the final rinse. Water temperatures should be 40-60°C (104-140°F).

Storage, Handling and Shelf Life:

Refrigeration is the recommended optimum storage condition for solderpaste to maintain consistent viscosity, reflow characteristics and overall performance. R593 should be stabilized at room temperature prior to printing. R593 should be kept at standard refrigeration conditions, 0-10°C (32-50°F). Please contact Kester if you require additional advice with regard storage and handling of this material. Shelf life is 4 months from date of manufacture when handled properly and held at 0-10°C (32-50°F).

Health & Safety:

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

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