

EnviroMark 814

Lead Free, Water-Soluble Solder Paste

Product Description

Kester EM814 is an organic acid, water soluble solder paste formula specifically designed for use with higher temperature, lead-free soldering alloys such as Sn96.5Ag3.0Cu0.5 as well as other similar SAC alloy compositions. EM814 is capable of stencil printing downtimes of up to 120 minutes with an effective first print down to 20 mils without any kneading. It offers good solderability and excellent wetting on various metallization in air reflow environment. EM814 is an extremely stable water soluble formula.

- Lead free and Water soluble
- Capable of 120 minutes idle time in printing
- Low voiding level
- Excellent solderability to a wide variety of metallization, including OSP, Ni/Au, Ni/Pd/Au, Sn, Ag
- Reduces scrap due to less paste dry out
- Stable tack life
- Residues easily removed with hot DI water
- Can reflow in air or nitrogen
- Classified as ORH0 per J-STD-004
- Compliant to Bellcore GR-78-CORE

Standard Applications

89.5% Metal – Stencil Printing

Physical Properties

(Data given for Sn96.5Ag3.0Cu0.5, 89.5% metal, -325+500 mesh
Data representative of most SnAgCu compositions)

Viscosity (typical) : 2226 poise

Malcom Viscometer PCU-203 @ 10 rpm, 25°C, measurement after 9 minutes

Initial Tackiness (typical) : 46 grams

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

Wetting Test: Pass

Tested to J-STD-005, IPC-TM-650, Method 2.4.45

Reliability Properties

Copper Mirror Corrosion: High

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

Corrosion Test: High

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

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

| | Blank | EM814 |
|--------------|-----------------------------|--------------------------|
| Day 1(24 h) | $7.2 \times 10^{10} \Omega$ | $2.5 \times 10^8 \Omega$ |
| Day 4(96 h) | $5.8 \times 10^{10} \Omega$ | $1.1 \times 10^9 \Omega$ |
| Day 7(168 h) | $4.9 \times 10^{10} \Omega$ | $1.1 \times 10^9 \Omega$ |

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

Tested to Bellcore GR-78-CORE

| | Blank | EM814 |
|-------------|-----------------------------|-----------------------------|
| Day 1(24 h) | $5.6 \times 10^{13} \Omega$ | $3.0 \times 10^{10} \Omega$ |
| Day 4(96 h) | $5.7 \times 10^{13} \Omega$ | $5.8 \times 10^{10} \Omega$ |

Application Notes

Availability:

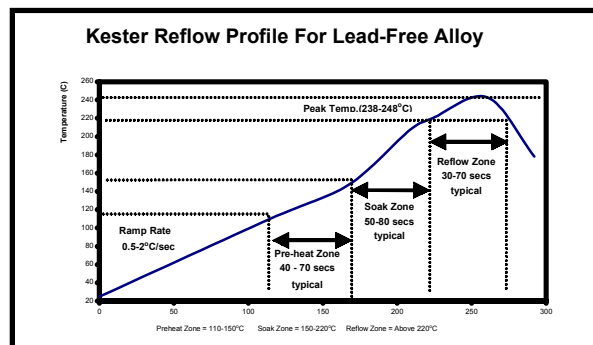
Kester EM814 is commonly available in the Sn96.5Ag3Cu0.5 and Sn96.5Ag3.5 alloys. Type 3 powder mesh is recommended but different powder particle size distributions are available for standard and fine pitch applications. EM814 is also compatible with other SnAgCu alloys in similar melting range to the listed alloys. For specific packaging information refer to Kester's Solder Paste Packaging Chart for available sizes. The appropriate combination depends on process variables and the specific application.

Printing Parameters:

| | |
|------------------------|--|
| Squeegee Blade | 80 to 90 durometer polyurethane or stainless steel |
| Squeegee Speed | Capable to a maximum speed of 100 mm/sec (4 in/sec), |
| Stencil Material | Stainless Steel, Molybdenum, Nickel Plated, Brass |
| Temperature / Humidity | Optimal ranges are 21-25°C (70-77°F) and 35-65% RH |

Recommended Reflow Profile:

The recommended convection reflow profile for EM814 formula made with either the SAC alloys is shown here. This profile is simply a guideline. Since EM814 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:

EM814 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. EM814 should be stabilized at room temperature prior to printing. EM814 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 when 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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