Product Description

Kester R520A is a lead free, organic acid, water-soluble solder paste formula specifically designed for use with the higher temperature Pb-Free alternative soldering alloys such as Sn96.5Ag3.0Cu0.5 (SAC Alloys). The solder paste exhibits long stencil life and tack time, while still delivering exceptional solderability to a wide variety of metallic substrates. R520A was formulated to release consistently from the stencil for those critical fine pitch applications (0.5 mm/20 mils) with anti-slump characteristics and preferred solder deposit definition. The activator package in this formula is extremely aggressive, providing superior wetting to OSP coated and Immersion Gold over Electroless Nickel (ENIG) boards. R520A is an extremely stable water-soluble formula.

- Lead free and water soluble
- Print speed up to 150 mm/sec (6 in/sec)
- Stable tack life to long stencil life
- Consistent printing over a range of temperatures and humidities
- Excellent wetting onto Ag/Pd leaded components
- Reduces scrap due to less paste dry out
- Residues easily removed with hot DI water
- Classified as ORH0 per J-STD-004

Physical Properties

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

Viscosity (typical): 2150 poise
- Malcom viscometer @ 10rpm and 25°C

Initial Tackiness (typical): 30 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: 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

<table>
<thead>
<tr>
<th></th>
<th>Blank</th>
<th>R520A</th>
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<tbody>
<tr>
<td>Day 1</td>
<td>$2.75 \times 10^{10} \Omega$</td>
<td>$1.66 \times 10^8 \Omega$</td>
</tr>
<tr>
<td>Day 4</td>
<td>$1.52 \times 10^{10} \Omega$</td>
<td>$6.60 \times 10^8 \Omega$</td>
</tr>
<tr>
<td>Day 7</td>
<td>$1.31 \times 10^{10} \Omega$</td>
<td>$1.27 \times 10^9 \Omega$</td>
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Standard Applications

89.5% Metal – Stencil Printing
89.9% Metal – Enclosed Head Printing

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.
Application Notes

Availability:
Kester R520A is available in the Sn96.5Ag3.0Cu0.5 alloy with Type 3 powder. 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 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 150 mm/sec (6 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 reflow profile for R520A made with SAC alloys is shown here. This profile is simply a guideline. Since R520A is a highly active solderpaste, 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:
R520A residues are best removed using automated cleaning equipment (in-line or batch) within 24 hours of soldering. De-ionized water is recommended for the final rinse. Water temperatures should be 49-60°C (120-140°F). Kester's 5768 Bio-Kleen® saponifier can also be used in a 1-2% ratio for aqueous cleaning systems.

Storage, Handling, and Shelf Life:
Refrigeration is the recommended optimum storage condition for solder paste to maintain consistent viscosity, reflow characteristics, and overall performance. R520A should be stabilized at room temperature prior to printing. R520A should be kept at standard refrigeration temperatures, 0-10°C (32-50°F). Please contact Kester if you require additional advice with regard to storage and handling of this material. Shelf life is 4 months from date of manufacture and held at 0-10°C (32-50°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.

The data recommendations presented are based on tests, which we consider reliable. Because Kester has no control over the conditions of use, we disclaim any responsibility connected with the use of any of our products or the information presented. We advise that all chemical products be used only by or under the direction of technically qualified personnel who are aware of the potential hazards involved and the necessity for reasonable care in their handling. The technical information contained herein is consistent with the properties of this material but should not be used in the preparation of specifications as it is intended for reference only. For assistance in preparing specifications, please contact your local Kester office for details.