



kester®

Technical Data Sheet

WP616 Solder Paste

Lead-Free, Water-Soluble, Zero-Halogen



Product Description

WP616 is a zero-halogen, lead-free, water-soluble solder paste formula for both nitrogen and air reflow applications. WP616 provides a combination of consistent print performance at wide humidity levels, excellent solderability and ease of cleaning, while maintaining a zero-halogen flux formulation. WP616 is a stable water-soluble formula, providing consistent stencil life, tack time and print definition. WP616 is classified as ORM0 flux under IPC J-STD-004B.

Performance Characteristics:

- Superior reflow characteristics
- Classified as ORM0 per J-STD-004B
- Excellent activity and printability
- Zero-Halogen (none intentionally added)
- Wide reflow profile window with good solderability
- Reflowable in air and nitrogen conditions
- Cleaning can be accomplished with heated de-ionized water

RoHS Compliance

This product meets the requirements of the Restriction of Hazardous Substances (RoHS) Directive. Additional RoHS information is located at <https://www.kester.com/downloads/environmental>.

Physical Properties

(SAC 305, T4)

Viscosity (typical): 1700 poise
Malcom Viscometer @ 10 rpm, 25°C

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

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

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

Reliability Properties

Copper Mirror: Low
Tested to J-STD-004, IPC-TM-650, Method 2.3.32

Copper Corrosion: Low
Tested to J-STD-004, IPC-TM-650, Method 2.3.32

Halogen Content: None Detected
Tested to J-STD-004B, IPC-TM-650, Method 2.3.41

Silver Chromate: Halides Detected
Tested to J-STD-004, IPC-TM-650, Method 2.3.33

Surface Insulation Resistivity (SIR): Pass
Tested to J-STD-004B, IPC-TM-650, Method 2.6.3.7; Test Conditions: 40°C, 90% RH, 7 days, 12.5V

Electro Chemical Migration (ECM): Pass
Tested to J-STD-004B, IPC-TM-650, Method 2.6.14.1

Availability

WP616 is available in Sn96.5Ag3Cu0.5 alloy with type 3 and type 4 powder mesh. Type 4 mesh size is recommended for standard and fine pitch applications. WP616 is also compatible with other SnAgCu alloys in similar melting range to the listed alloy. For specific packaging information, refer to Kester's Solder Paste Packaging Chart for available sizes. The appropriate combination depends on the process variables and the specific application.

Printing Parameters

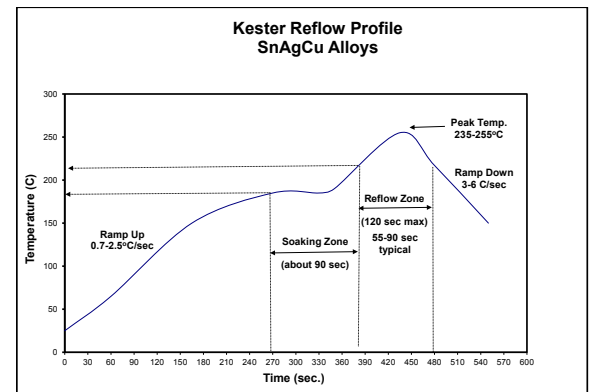
Below are process guidelines, and it is advisable to note that the optimum setting for a given assembly may vary and this is dependent on the circuit board design, board thickness, components used, and equipment used. A design of experiments is recommended to be done to optimize the soldering process. In addition, incoming solderability inspection of circuit boards and components is recommended as part of process control to maintain consistent soldering performance and electrical reliability.

Printing Process Parameters	Recommendations
Solder Paste Bead Size	Initial 2cm (0.75in); Add below 1.4cm (0.5in)
Squeegee Angle	60 deg. from horizontal
Speed	25-150 mm/sec (1-6 in/sec)
Pressure ¹	0.18-0.27 kg/cm (1-1.5 lb/in)
Separation Speed	2-10 mm/sec
Stencil Life	6 hours at 20-30°C (68-86°F) / 35-65% RH

¹ Pressure should be increased with increasing print speed. First set the print speed. Then set the pressure to the minimum required to clean the solder paste off of the stencil.

Recommended Reflow Profile

The recommended reflow profile for formula made with SAC alloys is shown here. This profile is simply a guideline. WP616 has excellent solderability and wetting across a wide range of profiles, with similar performance in air and nitrogen. Your optimal profile may be different from the one shown based on your oven, board and mix of defects. Contact Kester Technical Support if you need additional profiling advice.



Cleaning

WP616 is a water-soluble formula. Its residues are best removed using automated cleaning equipment (in-line or batch). De-ionized water heated to 48-82°C (120-180°F) should be used followed by a final rinse with de-ionized water. It is recommended to clean the circuit board after each reflow cycle. Commercial cleaning agent can be used. Contact your supplier for recommendations.

Storage, Handling and Shelf Life

Shelf life is 6 months from date of manufacture when refrigerated. Refrigeration (0-10°C/32-50°F) is the recommended storage condition for solder paste to maintain consistent viscosity, reflow characteristics and overall performance. WP616 should be stabilized at room temperature prior to printing. Please contact Kester Technical Support if you require additional advice with regards to handling and storage of this material.

Health and Safety

This product, during handling or use, may be hazardous to your health or the environment. Read the Safety Data Sheet and warning label before using this product. Safety Data Sheets are available at <https://www.kester.com/downloads/sds>.