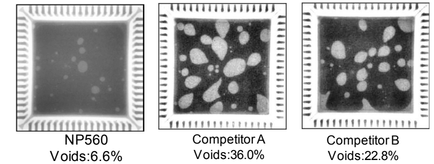
kester® Technical Data Sheet



NP560 Solder Paste

No-Clean, Lead-Free, Low Voiding under QFNs

Product Description

NP560 is a no-clean, lead-free, halogen-free solder paste. It consistently delivers paste transfer efficiencies of 0.50 to 0.55 AR and is fully capable of printing and reflowing 01005 components, even in air, with minimal graping behavior. In addition to its stable, consistent product performance, NP560 has redefined the voiding standard for PCB assembly and has the potential for low voiding performance.

Performance Characteristics:

- Classified as ROL0 per J-STD-004B
- Halogen-Free
- Low voiding potential under QFNs
- Excellent activity and printability
- Very low graping
- Reflowable in air and nitrogen conditions
- Wide reflow profile window with good solderability on various PCB surface finish

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 (typical)

Viscosity (typical): 1300 poise
Malcom Viscometer @ 10 rpm, 25°C

Initial Tack: 30gm
Tested per J-STD-005, IPC-TM-650, Method 2.4.44

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

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

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

Wetting: Pass
Tested per 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
Per IPC-TM-650 Method 2.6.15

Halogen Content: None Detected
Per IPC-TM-650, Method 2.3.81

Silver Chromate: None Detected
Tested to J-STD-004, IPC-TM-650, Method 2.3.33

Fluoride Spot Test: None Detected
Tested to J-STD-004, IPC-TM-650, Method 2.3.35.1

Surface Insulation Resistance (SIR): Pass
Per IPC-TM-650 Method 2.6.3.7 [40°C, 90% RH, 12.5V, 7days]

Electrochemical Migration (ECM): Pass
Per IPC-TM-650 Method 2.6.14.1 [65°C, 90% RH, 100V, 25days]

Availability

NP560 is available in Sn96.5Ag3Cu0.5 alloy with Type 3 (T3), Type 4 (T4) and Type 5 (T5) powder mesh. Type 4 mesh size is recommended for standard and fine pitch applications. Type 5 is recommended for ultra-fine pitch applications. NP560 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.

Process Guidelines

Below information 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.

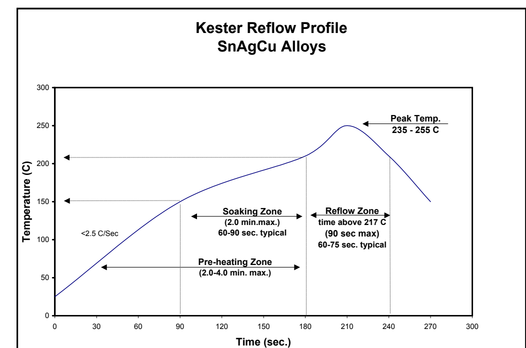
Printing Process Parameter	Recommendations
Solder Paste Bead Size	Initial 2cm (0.75in); Add below 1.4cm (0.5in)
Squeegee Angle	60 deg. from horizontal; 45 deg. for pin in paste
Speed	25mm/sec-150mm/sec (1-6in/sec)
Pressure[1]	0.18-0.27 kg/cm (1-1.5 lb/in)
Separation Speed	2-10mm/sec
Underside Cleaning[2]	Solvent, vacuum and dry wipe recommended
Stencil Life	8 hours at 65-85°F and 10-70% 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.
[2]Some cleaning chemistry can interact with the solder paste and can impact print performance.

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.

Reflow Process Parameter	Recommendations
Time from 45°C to peak	3.5-4.5 min
Ramp rate	0.7-2.0°C/sec
Preheat time (130-180°C)	30-90 sec (70 sec target)
Peak temperature	235-255°C for SAC alloys
Cooling Rate	3-6°C/sec

Note: TAL should be calculated based on the liquidus point of the alloy used: SAC305 221°C. Adding a soak between 180 and 200°C for 20-30 seconds can further reduce voiding and reduce the potential for tombstoning.



The recommended reflow profile for NP560 formula made with SAC alloys is shown here. This profile is simply a guideline. NP560 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. For optimal reflow profile for void reduction or additional profiling advice, contact Kester Technical Support.

Cleaning

NP560 residues are non-conductive, non-corrosive, and do not require removal. If it is desired to remove the residues, commercially available residue cleaner may be used. Contact Kester Technical Support for additional assistance.

Storage, Handling and Shelf Life

The shelf life for NP560 T3 and T4 is 12 months from the date of manufacture when stored in refrigeration and can be stored up to 4 weeks at room temperature (up to 27°C/80°F) with minimal impact to overall product performance. NP560 T5 has a refrigerated shelf life of 6 months. Refrigeration (0-10°C/32-50°F) is the recommended storage condition for solder paste to maintain consistent viscosity, reflow characteristics, and overall performance. When refrigerated, NP560 should be stabilized to room temperature prior to use. 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.

Global Headquarters: 800 West Thorndale Avenue, Itasca, IL USA 60143 ▪ Phone: +1 800.2.KESTER ▪ Fax: +1 630.616.4044
Asia-Pacific Headquarters: 61 Ubi Avenue 1 #06-01 UB Point, Singapore 408941 ▪ Phone: +65 6.449.1133 ▪ Fax: +65 6.242.9036
European Headquarters: Ganghofer Strasse 45, 82216 Gernlinden, Germany ▪ Phone: +49 (0) 8142 4785 0 ▪ Fax: +49 (0) 8142 4785 61
Asia Manufacturing: Hengqiao Road, Wujiang Economic Development Zone ▪ Suzhou, Jiangsu Province, China 215200 ▪ Phone: +86 512.82060807 ▪ Fax: +86 512.8206 0808
▪ Website: www.kester.com ▪