

Lead-free Solder Paste AP-40

General Description

Solder paste AP-40 is a further development of AP-20 solder paste with regard to easier handling and longer open times. AP-40 provides a very wide process window. The unique properties of the used materials allow the user to process boards much longer after printing without losing any of the original tackiness of the printed solder deposit. This facilitates in many cases flexible planning and implementation of the individual process steps of printed circuit board assembly.

AP-40 was developed for lead-free soldering however it works also excellent with tin/lead solder alloys allowing the use of one paste flux for leaded and lead-free processes. The use of chemically modified resin materials results in a very high reproducibility of the solder paste. For the user this means constant printing results from board to board.

Under suitable storage conditions the viscosity of AP-40 remains practically unchanged. As a result, solder paste AP-40 can be stored for at least 6 months (maintaining the recommended temperature ranges for storage) without any deterioration of the excellent processing properties of the paste (good rolling on the stencil, slump resistance, tackiness). So even smaller and medium sized operations will be able to enjoy the benefits of procuring economically attractive solder paste quantities.

TAMURA ELSOLD solder paste AP-40 is well suited for fine-pitch applications. Optimized production processes and high-grade raw materials guarantee good slump resistance. No slumping of the printed solder paste deposits has been observed and – as a consequence – no bridging or solder balling after reflow. The solder paste deposits show very constant shapes and profiles, from print to print, from shift to shift (DIN 32513, 150 µm stencil, smallest gap 0.2 mm, at room temperature and 5 min at 150 °C).

Besides these special benefits TAMURA ELSOLD solder paste AP-40 has a wide process window, both under air as well as under nitrogen, meeting the diverse requirements of different PCB configurations. While a linear profile will guarantee best results, soak profiles have in many cases yielded excellent results as well.

With AP-40 excellent soldering results can be achieved on all normal surfaces and with different component surface finishes. Solder balling, wetting, and slump resistance test results exceed customer requirements.

Physical Properties

All data apply to Sn96.5Ag3Cu0.5, metal content of 89 %, grain size 25 – 45 µm

Viscosity: 650 ± 100 Pa·s (Plate-plate viscosimeter)

Reliability Properties

Copper mirror Test: Pass

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

Silver chromate Test: Pass

J-STD-004, IPC-TM-650, Method 2.3.33

Solder Balling Test: Pass

J-STD-005, IPC-TM-650, Method 2.4.34

SIR Measurements: > 10⁸ Ω, 2.1·10⁹ Ω*),

climate 40 °C/93 % RH; 168 hrs; 5 V DC, track width 400 µm, gap 200 µm

Electro-migration: no dendrites

climate: 40 °C/93 % RH.; 168 hrs; 5 V DC.

*) smallest value measured during the test duration of 168 hrs.

Technical Product Information

Lead-free Solder Paste AP-40

Classification

ELSOLD solder paste AP-40 is completely free from halides and halogens and classified as RELO per J-STD-004 or DIN EN 61190-1-1.

Application

The solder paste can be used by dispensing, stencil printing or screen printing. In general we recommend the following metal content ratios for the respective processes:

Alloy	Powder Type	Meting Range	Metal Content for Stencil or Screen Printing	Metal Content For Dispensing
Sn96.5Ag3Cu0.5	T3 (25 – 45 µm)	217 – 219 °C	88 – 90 %	85 – 87 %
Sn96.5Ag3Cu0.5	T4 (20 – 38 µm)	217 – 219 °C	88 – 90 %	85 – 87 %
Sn96.5Ag3Cu0.5	T5 (15 – 25 µm)	217 – 219 °C	87 – 88 %	85 – 87 %
Sn96.5Ag3Cu0.5	T6 (05 – 15 µm)	217 – 219 °C	87 – 88 %	85 – 87 %
Sn98.5Ag1Cu0.5	T3 (25 – 45 µm)	217 – 222 °C	88 – 90 %	85 – 87 %
Sn99Ag0.3Cu0.7	T4 (20 - 38 µm)	217 – 227 °C	88 – 89 %	85 – 87 %

Solder Paste AP-40 is also available with micro-alloyed solder powder Sn96.5Ag3Cu0.5 MA in T4!

Cleaning

TAMURA ELSOLD solder paste AP-40 is a no clean paste and leaves only very few, light residues which can remain on the solder joint without causing any electro-migration problems. If for cosmetic reasons cleaning should be required the residues may be removed by isopropanol or by any commercially available cleaning agent.

Packaging

Jars: 250 g and 500 g Cassettes: DEK PRO-FLOW™ Cassettes
Cartridges: 600 g and 1200 g (SEMCO) Syringes: 10 cc and 30 cc

Storage and Shelf Life

Jars: up to 6 months
Cartridges: up to 6 months Syringes: up to 3 months

Store at 6 – 16 °C in un-opened original containers.

Storage at 20 °C is possible for several weeks (2-3 months). Refrigerated storage at 6 – 16 °C is recommended for extended storage times. When stored in the fridge the material should be allowed to reach room temperature without any heating before opening containers to avoid condensation of moisture on the cold material.

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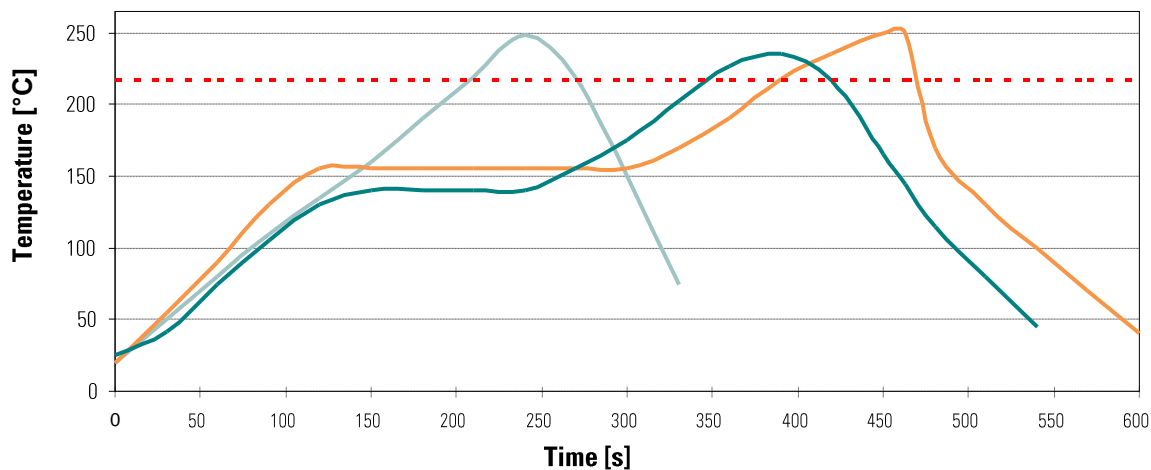
Print Parameters

Squeegee:	Stainless steel
Squeegee speed:	25 – 150 mm/s
Squeegee pressure:	150 – 300 g/cm length
Stencil:	Stainless steel

Reflow Profile for Sn96.5Ag3Cu0.5

TAMURA ELSOLD solder paste AP-40 yields good results for a wide range of temperature profiles. A linear profile is recommended as the starting point for further process optimisation.

Typical Profile AP-40 / Sn96.5Ag3Cu0.5



RoHS Conformity

ELSOLD solder pastes AP-40 comply with RoHS Directive 2002/95/EC.

Norms

The paste meets the requirements of international norms J-STD-005 and DIN EN 61190-1-2, as well as DIN 32513-1.

The information contained herein is based on technical data that we believe to be reliable and is intended for use by persons having technical skill, at their own risk. Users of our products should make their own tests to determine the suitability of each product for their particular process. TAMURA ELSOLD will assume no liability for results obtained or damages incurred through the application of the data presented.