

WS889 Water Soluble Solder Paste

Lead-Free

INTRODUCTION

WS889 is a water soluble, lead-free solder paste. WS889 has been formulated with high activity which provides excellent wetting, and very low solder balling and graping. WS889 flux residues are clear and are easy to clean using warm water.

ATTRIBUTES

- Excellent wetting
- Very low solder balling and graping
- Clear residues that are easy to clean

ALLOY AND POWDER SIZE

SN100C	Type 3 and 4
SAC305 (Sn96.5/Ag3.0/Cu0.5)	Type 3 and 4
Sn96.5/Ag3.5	Type 3
Anti-tombstoning mixtures	Type 3

PACKAGING

Jars	250, 500 grams
Cartridges	500, 600 grams
Syringes	30, 100 grams
Enclosed print systems	

STORAGE AND HANDLING

- Store solder paste at 5 – 10°C (40 – 50°F).
- Warm to room temperature for at least 4 hours before use, but warming overnight is desired. Do not open the container during the warming period.
- Once opened, do not refrigerate the solder paste again. Keep it in a sealed container at room temperature.
- Solder paste can be stored at room temperature for up to 2 weeks.
- Solder paste used on the printer should not be returned to the container with the fresh solder paste. It should be stored in a separate container at room temperature.
- Once the solder paste is printed, the circuit boards are usable for up to 8 hours. Beyond this time, the solder paste should be cleaned off of the circuit boards.

J-STD-004 DATA

Classification	ORH1
Copper mirror (TM 2.3.32)	High activity
Halide content (TM 2.3.28.1)	0.30 – 0.60 % wt.
Silver chromate (TM 2.3.33)	Halides present
Fluoride spot test (TM 2.3.35.1)	None detected
SIR (TM 2.6.3.7)	Pass > 1.00E+08 ohms
ECM (TM 2.6.14.1)	Pass, increase of 1.9 Log ₁₀ ohms

J-STD-005 DATA

Viscosity Brookfield (TM 2.4.34)	700 – 900 Kcps
Slump (TM 2.4.35)	Pass
Solder balling (TM 2.4.43)	Pass
Wetting (TM 2.4.45)	Pass

STENCIL DESIGN

Slic stencils from Fine Line Stencil are recommended for fine feature printing down to an area ratio of 0.55. NanoSlic Gold coating should be used for area ratios below 0.55.

PRINTER PARAMETERS

Solder paste bead size	Initial 2 cm (0.75 in) Add below 1.4 cm (0.50 in)
Squeegee	Slic metal preferred 60 deg. from horizontal
Speed	25 to 100 mm/sec (1 to 4 in/sec)
Pressure	0.18 to 0.27 kg/cm (1 to 1.5 lb/in)
Underside cleaning	Solvent and dry wipe recommended. NanoSlic Gold enables wiping every 20 – 40 prints
Stencil life	4 hours at 65-85 °F and 10-70% RH

REFLOW PROFILE - LINEAR

Time from 45°C to peak	3.5 to 4.5 min
Ramp rate	0.7 to 2.0 °C / sec
Preheat time (130–180°C)	30 - 90 sec (70 sec target)
Peak temperature	235 – 255 °C for SAC alloys 240 – 260 °C for SN100C
Time above liquidus (TAL)	45 – 75 sec (60 sec target)
Cooling rate	3 – 6 °C / sec

TAL should be calculated based on the liquidus point of the alloy used: SN100C 227°C, SAC305 221°C, Sn96.5/Ag3.5 221°C.

Adding a short soak between 180 and 200 °C for 10 – 20 seconds can reduce the potential for tombstoning.

Increasing the peak temperature by 10 - 15 °C can reduce the potential for voiding. We do not recommend the use of a long soak with WS889 solder paste because it might increase the potential for voiding.

CLEANING

Raw solder paste can be removed from the stencil using isopropyl alcohol or a variety of commercial cleaners. When solder paste is left on the stencil unused for more than 4 hours, then the stencil should be cleaned.

Reflowed flux residues should be cleaned within 24 hours after reflow. DI water heated to 120 – 180°F should be used. It is recommend to clean the circuit boards after each reflow cycle. If the flux residues are reflowed more than once, then the residues may be difficult to remove with DI water alone, and a commercial cleaning agent may have to be used.