STANNOL

greenconnect

# SOLDER PASTE SP6000 TBS04-90-4 (Bi57,6Sn42Ag0,4)

No-Clean Solder Paste

## PRODUCT DESCRIPTION

The solder paste SP6000 TBS04 is part of Stannol's sustainable greenconnect product line. What makes it special: This solder paste enables more than 85 percent $CO_2$ emissions savings compared to conventional solder pastes, primarily due to the use of recycled solder.

The TBS04 alloy (Bi57.6Sn42Ag0.4) is a low-melting solder alloy with a melting range of 138–140 °C.

## CLASSIFICATION AND CHARACTERISTICS

**The product offers the following advantages:**

- **solder powder from recycled solder**
- **about 85 % $CO_2$ savings**
- **low melting point**
- **suitable for fine-pitch down to 0.4 mm**
- **excellent print definition after longer printer downtime**
- **reflow soldering possible in air or nitrogen**
- **excellent wetting on most surfaces**
- **RoHS compliant**

## APPLICATION

**Paste printing:** The solder paste was developed for stencil printing. SP6000 TBS04 with particle size type 4 (20–38 µm) is suitable for all common open and closed printing systems.
**Stencil**: 100–150 µm

**Recommendations for paste printing:**

1. Always use the lowest possible stencil thickness.
2. Use stencils with rounded corners to minimize clogging of stencil apertures.
3. Set squeegee pressure to 0.25 kg/cm of squeegee length. Then, gradually reduce the pressure until smearing occurs. At this point, squeegee force is optimally adjusted. Make these settings for your desired print speed.
4. The optimal print speed with SP6000 TBS04 solder paste is in the range of 20–100 mm/s.
5. Ensure tight sealing between PCB and stencil. The PCB must be well-supported to seal against the stencil, preventing solder paste from being pushed sideways past the pads.

**Recommendations for reflow profile:**
Average ramp-up: 1–3 K/s
Peak temperature: 15 °C (min) to 40 °C (max) above the melting point. For improved electrical safety of assemblies, we recommend a peak temperature >165 °C.
Time above liquidus: 45–90 s
Reflow atmosphere: Air or nitrogen with <2000 ppm residual oxygen

## CLEANING

Stannol SP6000 TBS04 is a No-Clean solder paste. This means cleaning of residues is not mandatory. If cleaning is necessary, residues can be removed using conventional cleaning processes. We recommend using Stannol Flux-Ex Pre before soldering and Flux-Ex Post Power to remove residues after soldering.

## TECHNICAL SPECIFICATION

**Solder powder:** Permissible impurities in this solder powder comply with ANSI/J-STD-006. The nominal solder powder particle size is 20–38 µm (Type 4), with a precisely controlled particle size distribution and spherical shape.

| **GENERAL PROPERTIES** | |
|---|---|
| **Alloy:** | TBS04 (Bi57,6Sn42Ag0,4) |
| **Melting Range, °C:** | 138 - 140 |
| **Metal Content, %:** | 90 |
| **Solder Powder, µm:** | 20-38 (type 4) |
| **Application:** | paste printing |

The values listed above are typical and do not represent a specification.

| **Test** | **Specification** | **Result** |
|---|---|---|
| **Copper Corrosion:** | ANSI/J-STD-004C<br>IPC-TM-650, Methode 2.6.15 | pass |
| **Copper Mirror:** | ANSI/J-STD-004C<br>IPC-TM-650, Methode 2.3.32 | pass |
| **Surface Insulation Resistance:** | ANSI/J-STD-004C<br>IPC-TM-650, Methode 2.6.3.3/2.6.3.7 | pass |
| **Silver Chromate Paper Test:** | ANSI/J-STD 004<br>IPC-TM-650, Methode 2.3.33 | pass |
| **Chlorides:** | ANSI/J-STD-004C<br>IPC-TM-650, Methode 2.3.35 | no addition |
| **Bromides:** | ANSI/J-STD-004C<br>IPC-TM-650, Methode 2.3.35 | no addition |
| **Solder Ball Test:** | ANSI/J-STD-005A<br>IPC-TM-650, method 2.4.43<br>after 1 h at room temperature<br>after 24 h at room temperature | <br><br>pass, class 1<br>pass, class 1 |
| **Wetting Test:** | ANSI/J-STD-005A,<br>IPC-TM-650, method 2.4.45 | pass, class 1 |
| **Slump Test:**<br>**(T4, Schablone 150 µm)** | 10 minutes at 150 °C | pass, 0,3 mm |
| **Open Time:** | internal specification | at least 8 h at 23 °C/65 % rh |
| **Flux Activity Class:** | J-STD-004 | REL0 |

**Note**: The PCBs for the SIR test were soldered at a peak temperature of 180 °C.

## DELIVERY FORMS

Stannol SP6000 TBS04 solder paste is available in the following packaging:

- 500 g plastic jars

Other packaging forms are available upon request and may be subject to minimum order quantities.

## STORAGE AND SHELF-LIFE

At a storage temperature of 2 to 8 °C, the minimum shelf life is 6 months from the date of manufacture in the unopened original container. Allow the paste to warm to room temperature in the closed container for approximately 2 hours before use to avoid condensation on the surface.

## HEALTH AND SAFETY

Please read the safety data sheet and observe safety precautions before first use.

## DISCLAIMER