



SOLDER ECOLOY TSC105

Lead-free solder alloy for electronic application

DESCRIPTION

Stannol Ecoloy TSC105 (S-Sn98.55Ag1.0Cu0.5) is a lead-free alloy according to DIN EN ISO 9453 (alloy no. 716).

Due to the lower silver content compared to the eutectic composition (TSC), costs are saved. Compared to the silver-free solder TC or the low-silver variant (TSC0307), the wetting properties are better. This helps avoiding wetting-related soldering defects. In addition, the creep and tensile strength is higher, so the resistance of thermomechanical load changes also increases (low cycle fatigue).

The use of Ecoloy TSC105 guarantees that lead-free assemblies can be produced according to WEEE and RoHS.

CHARACTERISTICS

Stannol Ecoloy TSC105 offers the following advantages:

- tin-silver-copper alloy (melting range at 217-227°C).
- low silver content saves costs for silver on 66% compared with conventional tin/silver/copper alloys.
- good wetting performance, better than Sn-Cu base alloy.
- extended operating conditions due to lower copper content.

APPLICATION

When using this alloy, as with all other lead-free alloys, the temperature profile must be adapted to the production equipment and the produced assemblies. The resulting solder joints will be comparable or even better in terms of their properties to solder joints produced with Sn/Pb solders. By increasing the copper content in the solder bath the liquidus will increase, too. Therefore, regular analytical control is necessary to ensure that the Cu concentration from which soldering defects could occur (generally >0.9%) is not exceeded.

PHYSICAL AND MECHANICAL CHARACTERISTICS OF ECOLOY SOLDERS IN COMPARISON WITH S-Sn63Pb37

GENERAL PROPERTIES	S-Sn63Pb37***	Stannol Ecoloy TSC (S-Sn95.5Ag3.8Cu0.7)*	Stannol Ecoloy TSC105 (S-Sn98.5Ag1.0Cu0.5)*
Melting Point / Range, °C:	183	217	217-227
Electrical Conductivity, %IACS:	11.9	13	13
Electrical Resistivity, μΩcm:	14.5	13	13
Brinell Hardness, HB:	17	15	n.a.
Density, g/cm³:	8.4	7.5	7.3
Tensile Strength, 20°C/N mm⁻² at 0.004 s⁻¹ Shear Rate:	40	48	48

* Complying with DIN EN ISO 9453

RECOMMENDED CONDITIONS OF USE

Wave Soldering: The recommended operation conditions for wave soldering are the same like normal Ecoloy TC and Flowtin TC solders. Soldering bath temperatures from 255-270°C are possible; on selective soldering process higher temperatures may be applicable depending on the thermal demand of the components.

Wave soldering: The lower Cu content in wave soldering is advantageous, as the wave solder bath has a longer service life. The copper content in the solder bath increases due to the copper leaching from the circuit board. It takes longer to reach the critical level of approx. 0.9% Cu.

The use of Ecoloy TSC105 as wave solder requires a solder bath temperature of approx. 265°C. Depending on the type of circuit board an component spectrum, the optimum temperature can be adapted to process requirements. The use of inert gas, Nitrogen, adds a significant extension of the process window. Wetting of the solder is simplified and, when it exits the wave, no excess solder remains on the components. In addition, dross formation is considerably reduced.

Wave solder flux: In principle, conventional alcohol based fluxes such as Stannol EF350 are suitable for the lead-free soldering process. The solid content should not be too low, as due to the increased preheating and wave temperature, better activity and temperature stability are of importance. A completely ecological solution is the use of VOC-free fluxes, e.g. Stannol WF300S or WF130/WF131. When using water based fluxes, due to the solvent, the process requirements must be adapted to the specific properties of these fluxes.

SUPPLY FORMS

Triangular bars
Kg-bars
Ingots with suspension eye

HEALTH AND SAFETY

Before using please read the material safety data sheet carefully and observe the safety precautions described.

NOTICE

The above values are typical and represent no form of specification. The Data Sheet serves for information purposes. Any verbal or written advise is not binding for the company, whether such information originates from the company offices or from a sales representative. This is also in respect of any protection rights of third parties, and does not release the customer from the responsibility of verifying the products of the company for suitability of use for the intended process or purpose. Should any liability on the part of the company arise, the company will only indemnify for loss or damage to the same extent as for defects in quality.