

**STANNOL®**

Wenn's ums Löten geht  
When it's about soldering  
Quand il s'agit du soudage

## Technical Data Sheet

### STANNOL® Solder ECOLOY® TC

#### Lead-Free Alloy for Electronics

- Pure Tin-Copper Alloy - No Other Additions
- Patent-Free Alloy – No Licence Fees
- Well Approved in Electronic Production
- Eutectic Alloy (Melting Point 227°C )
- Good Wetting Properties
- Valuable Price – No Silver

#### Description

**STANNOL® ECOLOY® TC** (Sn99Cu1) is a lead-free solder according to ISO 9453:2006 (alloy no. 401) to eliminate tin-lead alloys in all processes of electric and electronic manufacturing. The use of **ECOLOY® TC** guarantees that lead-free assemblies can be produced according to WEEE and RoHS.

**STANNOL® ECOLOY® TC** eliminates problematic disposal of lead containing waste.

#### Application

Using **ECOLOY® TC** solder requires adaptation of machine settings. Temperature profiles must match with the high melting point of the alloy and the thermal demand of the PCB. The properties of solder joints manufactured with **ECOLOY® TC** are comparable with those soldered with tin-lead alloys. This alloy can be used for wave soldering as well as for dip tinning e.g. for wire beads.

#### Physical and Mechanical Properties of ECOLOY® Solders compared with Sn63Pb37:

Properties	S-Sn63Pb37*	STANNOL® ECOLOY® TSC (S-Sn95Ag4Cu1)*	STANNOL® ECOLOY® TS (S-Sn96Ag4)*	STANNOL® ECOLOY® TC (S-Sn99Cu1)*
Melting point/ range, °C	183	217	221	227
Electrical Conductivity, %IACS	11.9	13	14	15.6
Electrical Restivity, µΩcm	14.5	13	12.3	12.6
Brinell Hardness, HB	17	15	15	9
Density, g/cm <sup>3</sup>	8,4	7.5	7.5	7.3
Shear tension, (20°C)/ N mm <sup>-2</sup> at 0,004 s <sup>-1</sup> Shear rate	40	48	58	48
Shear resistance N mm <sup>-2</sup> at 0,1mm <sup>-1</sup> , 20°C at 0,1mm <sup>-1</sup> , 100°C	23 14	27 17	27 17	27 17
Creep resistance* N mm <sup>-2</sup> 20°C 100°C	3.3 1.0	13.0 5.0	13.7 5.0	13.0 5.0

\*Complying with ISO 9453:2006

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## Recommended Conditions of Use

### Wave soldering

The use of **ECOLOY® TC** Solder requires a soldering temperature of about 260 to 280°C. Optimum conditions must be found out depending on the type of PCB. The application of additional Inertgas is very helpful. The absence of Oxygen and oxides on the solder surface will enhance the wetting of the solder and when leaving the solder wave no excessive solder will remain on the solder joint. Inertgas will reduce the formation of bridges and icicles. The formation of dross will be reduced enormously.

### Fluxes for wave soldering

In principle all common fluxes like **STANNOL® EF350** are suitable for lead-free soldering. The solid content should not be as low as for tin-lead, because due to the high thermal demand of the PCB there is more preheat and higher solder bath temperature necessary. Therefore stability and sustainable activity is of importance. As a complete ecological solution the use of VOC-free liquid fluxes should be an option, e.g. **STANNOL® WF300S**. Because the solvent is water, all process requirements have to be adapted to the specific properties of the flux.

### Rework and Repair

All temperature profiles used for tin-lead have to be changed to new requirements of the lead-free alloys (melting point +44°C). If components are still with tin-lead coating, solder joint properties will become less reliable than completely lead free.

## Supply forms

Solder Wire (solid and flux cored)  
Triangular bars  
Kg-bars  
Ingots with hanging hole

## Health and Safety

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

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