

## SOLDER ECOLOY TS

Lead-free alloy for electronics manufacturing

### DESCRIPTION

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Stannol Ecoloy TS (S-Sn96.3Ag3.7) is a lead-free solder according to DIN EN ISO 9453 (alloy no. 701) to eliminate the usage of conventional tin/lead alloys in the existing production processes of electronics assembly.

Stannol Ecoloy TS assures that lead-free assemblies can be manufactured according to WEEE and RoHS when lead free PCBs and components are in use. Stannol Ecoloy TS eliminates the problematic disposal of lead containing waste materials.

### CHARACTERISTICS

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The product offers the following advantages:

- Pure tin/silver alloy
- Patent free alloy – no licence fees
- Tested with good performance in the electronics production
- Suitable to reduce the copper content of tin-silver-copper solder baths
- Good wetting characteristics
- Eutectic alloy (defined melting point at 221° C)

### APPLICATION

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On changing to lead-free production the temperature profile and process conditions for this alloy - like for any other lead free alloy, too - must be adjusted. The resulting solder joints will have comparable or even better characteristics than solder joints, which were made with Sn/Pb solders.

During the use in a solder bath the copper content may increase with the consequence, that the liquidus of the alloy is rising, causing soldering defects. Therefore a regular analytical control of the solder composition is necessary in order to maintain the copper content below 1%. The alloy TS can be used for all wave and selective soldering processes - as well as for static solder bath for dipping processes.

### COMPOSITION

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#### ECOLOY® TS

Silver 3.5 – 3.9%

Remainder: Tin

## PHYSICAL PROPERTIES AND DATA OF SOME ECOLOY ALLOYS COMPARED TO S-Sn63Pb37

GENERAL PROPERTIES	S-Sn63Pb37*	Stannol Ecoloy TSC (S-Sn95,5Ag3,8Cu0,7)**	Stannol Ecoloy TS (S-Sn96,3Ag3,7)**	Stannol Ecoloy TC (S-Sn99,3Cu0,7)**
<b>Melting Point/Range, °C:</b>	183	217	221	227
<b>Electrical Conductivity, %IACS:</b>	11,9	13	14	15,6
<b>Electrical Resistance, <math>\mu\Omega\text{cm}</math>:</b>	14,5	13	12,3	12,6
<b>Brinell Hardness, HB:</b>	17	15	15	9
<b>Density, g/cm<sup>3</sup>:</b>	8.4	7,5	7,5	7,3
<b>Tensile strenght, (20°C) / N mm<sup>-2</sup> bei 0,004 s<sup>-1</sup> Scherrate:</b>	40	48	58	48
<b>Joint shear strenght N mm<sup>-2</sup> bei 0,1mm<sup>-1</sup>, 20°C:</b>	23	27	27	27
<b>bei 0,1mm<sup>-1</sup>, 100°C:</b>	14	17	17	17
<b>Creep strenght* N mm<sup>-2</sup> 20°C:</b>	3,3	13,0	13,7	13,0
<b>100°C:</b>	1,0	5,0	5,0	5,0

\*\* Complying with DIN EN ISO 9453 \*shear stress for 103 h to failure

### RECOMMENDED CONDITIONS FOR USE

**Wave Soldering:** The use of Ecoloy TS as wave solder requires a bath temperature of approx. 265° C to 280° C. Depending on PCB type and types of components, the optimum process conditions must be determined. The usage of inert gas considerably extends the process window. The wetting of the solder will be easier, and there will be no excessive solder on the PCBs when leaving the wave. Moreover the formation of dross will be minimised considerably.

**Wave Soldering Fluxes:** In general, all conventional fluxes like Stannol EF350 or Stannol EF250 are suitable for the lead-free soldering process. The solid content should be high enough. Due to the increased preheating and wave temperature a better activity respectively temperature stability is an enormous advantage. As a complete ecological solution VOC free fluxes like Stannol WF300S can be used. In this case the process requirements must be adjusted to the specific characteristics of the water based flux.

**Selective Soldering:** The temperature profiles, which were made for tin/lead alloys, must be adjusted due to the higher melting point (+ 38-47°C compared with Sn/Pb eutectic). In case that components or PCBs have a lead containing coating, the solidus of the new alloy will be reduced to the solidus of the Sn/Pb/Ag alloy.

### SUPPLY FORMS

Solder Wire (solid), Triangular bars, Kg-bars, Ingots with hanging hole.

### HEALTH AND SAFETY

Before use 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.