



## SOLDER ECOLOY TSC305

lead-free alloy for electronics

### DESCRIPTION

Stannol Ecoloy TSC305 (S-Sn96.5Ag3Cu0.5) is a lead-free solder according to DIN EN ISO 9453 (alloy no. 711) to eliminate the usage of conventional tin/lead alloys in the existing production processes of electronics assembly.

Stannol Ecoloy TSC305 assures that lead-free assemblies can be produced according to WEEE and RoHS when lead free PCBs and components are in use.

Stannol Ecoloy TSC305 eliminates the problematic disposal of lead containing waste materials.

### CHARACTERISTICS

Stannol Ecoloy TSC305 offers the following advantages:

- proven in the electronics production
- enhanced wetting characteristics
- extended operating time by reduced copper content
- favourable price by low silver content

### APPLICATION

On changing to lead-free production the temperature profile and process conditions for this alloy - like for any other lead free alloys, 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 increases 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%.

### PHYSICAL AND MECHANICAL CHARACTERISTICS OF ECOLOY ALLOYS COMPARED TO S-Sn63Pb37

GENERAL PROPERTIES	S-Sn63Pb37*	Stannol Ecoloy TSC (S-Sn95.5Ag3.8Cu0.7)*	Stannol Ecoloy TSC305 (S-Sn96.5Ag3Cu0.5)*
Melting Point / Melting Range, °C:	183	217	217-220
Electrical Conductivity, %IACS:	11.9	13	13
Electrical Resistance, $\mu\Omega\text{cm}$ :	14.5	13	13
Brinell Hardness, HB:	17	15	15
Density, $\text{g/cm}^3$ :	8.4	7.5	7.5

\*Complying with DIN EN ISO 9453

## RECOMMENDED CONDITIONS OF USE

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**Wave Soldering:** The low copper content is advantageous for wave soldering because longer operating times of the solder bath can be achieved. By dissolving of copper from the PCB the copper content increases. Using ECOLOY® TSC305 means that it takes longer until the critical limit of 1.0% is reached.

The use of Ecoloy TSC305 as wave solder requires a bath temperature of approx. 265°C. Depending on PCB type and types of components, the optimum of the process conditions must be determined. The usage of inert gas brings a considerable extension of 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 are suitable for the lead free soldering process. The flux 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.

**Rework und Hand Soldering:** Adjusted flux content assures a proper soldering for rework and repair. The temperature profiles, which were made for tin/lead/silver alloys, must be adjusted due to the higher melting point (+ 34°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 eutectic Sn/Pb/Ag alloy.

## SUPPLY FORMS

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

## HEALTH AND SAFETY

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

## NOTICE

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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.