

SOLDER ECOLOY TS350

Lead-free alloy for electronics manufacturing

DESCRIPTION

Stannol Ecoloy TS350 (S-Sn96.5Ag3.5) is a lead-free solder according to DIN EN ISO 9453 (alloy no. 703) to eliminate the usage of conventional tin/lead alloys in the existing production processes of electronics assembly.

Stannol Ecoloy TS350 assures that lead-free assemblies can be manufactured according to WEEE and RoHS when lead free PCBs and components are in use. Stannol Ecoloy TS350 eliminates the problematic disposal of lead containing waste materials.

CHARACTERISTICS

The product offers the following advantages:

- Pure tin/silver alloy
- Patent free alloy – no licence fees
- Tested with good performance in the electronics production
- Good wetting characteristics
- Suitable to reduce the copper content of tin-silver-copper solder baths

APPLICATION

Changing from lead containing alloys to lead-free production, the temperature profile and process conditions for this alloy - as for any other lead free alloy, too – need to be adjusted. After the process optimization the resulting solder joints will be comparable or even have better characteristics than solder joints, which have been made with Sn/Pb solders.

During the use of a solder bath the copper content may increase. As a consequence herefrom the liquidus of the alloy is increasing too. This may result in soldering defects. Therefore a regular analytical control of the solder composition is necessary in order to maintain the copper content in a proper condition. The alloy TS350 can be used for all wave and selective soldering processes - as well as for static solder bath for dipping processes.

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

| GENERAL PROPERTIES | S-Sn63Pb37* | STANNOL ECOLOY TS350 [S-Sn96.5Ag3.5]* | STANNOL ECOLOY TSC305 [S-Sn96.5Ag3Cu0.5]* | STANNOL ECOLOY TS300 [S-Sn97Ag3]* |
|--|-------------|---|---|---|
| Melting Point/Range, °C: | 183 | 221 | 217-220 | 221-224 |
| Electrical Conductivity, %IACS: | 11.9 | 13 | 13 | 13 |
| Electrical Resistance, μΩcm: | 14,5 | 15 | 13 | 13 |
| Brinell Hardness, HB: | 17 | 15 | 15 | 15 |
| Density, g/cm³: | 8.4 | 7.5 | 7.5 | 7.5 |

*Complying with DIN EN ISO 9453

COMPOSITION

ECOLOY® TS350 Silver 3.5%(+/-0.2%), Remainder: Tin

| Element | %(by weight) |
|---------|--------------|
| Zn | <0.001 |
| Al | <0.001 |
| Cd | <0.002 |
| Au | <0.05 |
| Ni | <0.01 |
| Fe | <0.02 |

| Element | %(by weight) |
|---------|--------------|
| In | <0.1 |
| Pb | <0.07 |
| Sb | <0.1 |
| Bi | <0.1 |
| Cu | <0.05 |
| As | <0.03 |

RECOMMENDED CONDITIONS FOR USE

Wave Soldering: By dissolving copper from the PCB the copper content in the solder bath increases. Using Ecoloy TS350 results in a longer time till the solder bath composition reaches the critical limit of 1.0%Cu.

The use of Ecoloy TS350 as wave solder requires a bath temperature of approx. 260-280°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 minimized considerably.

Wave Soldering Fluxes: In general, all conventional fluxes like Stannol EF350 are suitable for the lead free soldering process. The solid content of the used flux should be not too low. 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 or WF130 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 metallization, the solidus of the alloy in the solder bath will be reduced. The lead content needs to be monitored properly to avoid reaching legal limitations (0.1%Pb).

SUPPLY FORMS

Solder Wire (solid)
Triangular bars
Kg-bars
Ingots with hanging hole; open or closed

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.