

SOLDER FLOWTIN TSC105

Lead-Free Solder Alloy for Electronic Application

DESCRIPTION

Stannol Flowtin TSC105 (Sn98.5Ag1Cu0.5) is a lead free alloy on the base of tin/silver/copper. This alloy is RoHS compliant.

Flowtin TSC105 is one of the second generation of lead-free alloys. It provides improved lead-free soldering results compared with standard SnCu and SnCuNi-alloys. Due to the micro alloying additions this alloy will ensure much more stable solder bath conditions. Copper dissolution from PCBs is highly reduced, which results in less monitoring and maintenance to keep the level of copper stable. The level of reduction in copper leaching is depending on equipment and soldering parameters.

Flowtin TSC105 reduces the metal costs compared with standard alloys like TSC/SAC305 and TSC/SAC387 by more than 30%.

CHARACTERISTICS

The Flowtin TSC105 alloy offers the following advantages:

- **Tin-Silver-Copper alloy (melting range at 217-225°C)**
- **Low silver content, saves costs compared with conventional eutectic or close eutectic tin/silver/copper alloys**
- **Good wetting performance - better than Sn-Cu base alloy**
- **Fine grain surface, reduced hot tears / shrinking holes**
- **Reduced dissolution of copper compared with standard solders**

APPLICATION

It is necessary to adjust machine settings, temperature profiles, and other parameters to the requirements of a lead free process. The properties of the solder joints are at least comparable or even better than conventional lead free solder joints of the same alloys.

The physical properties do not change by adding micro additives. There are differences between **Ecoloy TC (S-Sn99.3Cu0.7)** and **Flowtin TSC105**:

- **Better wetting of component leads and pads**
- **Improved process performance, soldering defects will be reduced**
- **Lower dissolution rate of substrate metal (copper)**
- **Less maintenance at the solder bath due to lower copper level increase over time**
- **Decrease of solidus to 217°C, slightly lower liquidus (224°C instead of 227°C)**

PHYSICAL PROPERTIES AND DATA OF ECOLOY AND FLOWTIN SOLDERS COMPARED TO S-Sn63Pb37

GENERAL PROPERTIES	S-Sn63Pb37*	STANNOL ECOLOY TC (S-Sn99.3Cu0.7)*	STANNOL FLOWTIN TSC105 (S-Sn98.5Ag1Cu0.5)**	STANNOL FLOWTIN+ TSC105 (S-Sn98.5Ag1Cu0.5)***
Melting Point, °C:	183	227	217-224	217-224
Electrical Conductivity, %IACS:	11.9	15.6	13	13
Electrical Resistivity, $\mu\Omega\text{cm}$:	14.5	12.6	13	13
Density, g/cm^3 :	8.4	7.3	7.3	7.3

* Complying with DIN EN ISO 9453

** Complying with DIN EN ISO 9453, with micro additives <0.1%

*** Complying with DIN EN ISO 9453, with micro additives <0.05% and desoxidation-additive

RECOMMENDED CONDITIONS OF USE

Wave and selective soldering: The recommended operating temperature for Flowtin TSC105 in wave solder equipment is the same like standard Ecoloy TSC105, as the melting range (217-225°C) remains unchanged. Optimum operating temperatures for waves are between 265-275°C, for selective soldering equipment the solder bath temperature can be set to 280-320°C. We highly recommend to keep the operating temperatures always as low as possible to reduce dross formation to the lowest possible level. If possible, increase the preheat temperatures instead of the solder bath temperatures for better soldering results.

PURITY

We manufacture this alloy according to the alloy number 716 in DIN EN ISO 9453, but with micro-additives of <0.1% for effective reduction of copper leaching. The level of the used micro additives should be monitored on a regular base. The analysis of these micro dopants is included in our regular analysis service. Please contact us if you require more information.

SUPPLY FORMS

- Massive solder wire
- Triangular bars
- Kg-bars
- Ingots with hanging hole (open and closed)
- Other forms can be made available upon request, minimum order quantities may apply

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.