SHENZHEN FITECH CO., LTD.

Technical Data Sheet

Solder paste Sn89.5Sb10Ni0.5 series

FTP -905 — FTP-9054、FTP-9055、FTP-9056

技术部

Technical Department

Technical Data Sheet

Solder Paste FTP -905

一、 Introduction

FTP-905 series solder paste is a high-quality printing solder paste prepared by SnSb10Ni0.5 high temperature solder powder with good sphericity, uniform particle size, low oxygen content and excellent halogen-free flux. It has good adhesion before soldering, less solvent evaporation during soldering, after soldering. No solder ball, has good wetting effect, less residue, low void. It is an ideal soldering material for high temperature packaging.

二、 ：Features and Advantages

1. Thermal and electrical conductivity is better than silver paste.
2. Good chemical activity, no solder ball, good wetting， low void.
3. Simple operation, able to choose from reflow oven, heating plate, oven.
4. Good thixotropy, suitable viscosity, good stability, no delamination, long working life.
5. Melting point 248-265℃, meet the requirements of secondary reflow packaging (secondary reflow peak temperature is lower than 245℃)

三、 Technical feature

1. Before reflow

Feature	**Result**	**Note**
Appearance	Light gray	Paste
Alloy	Sn89.5Sb10Ni0.5	
Powder size	FTP-9054 T4 20-38μm FTP-9055 T5 10-25μm FTP-9056 T6 5-20μm	Description
Alloy melting point	248~265℃	DSC
Powder content	87±2%	Adjustable
Solder density	3.8 ~ 4.2	
Viscosity	150±30Pa.s	Malcolm (10rpm)
Ti	0.6±0.2	Lg(3rpm/30rpm)
Halogen Cl+Br	< 1000ppm	
保质期 Shelf life	6 month@ 0-10℃	Sealed storage

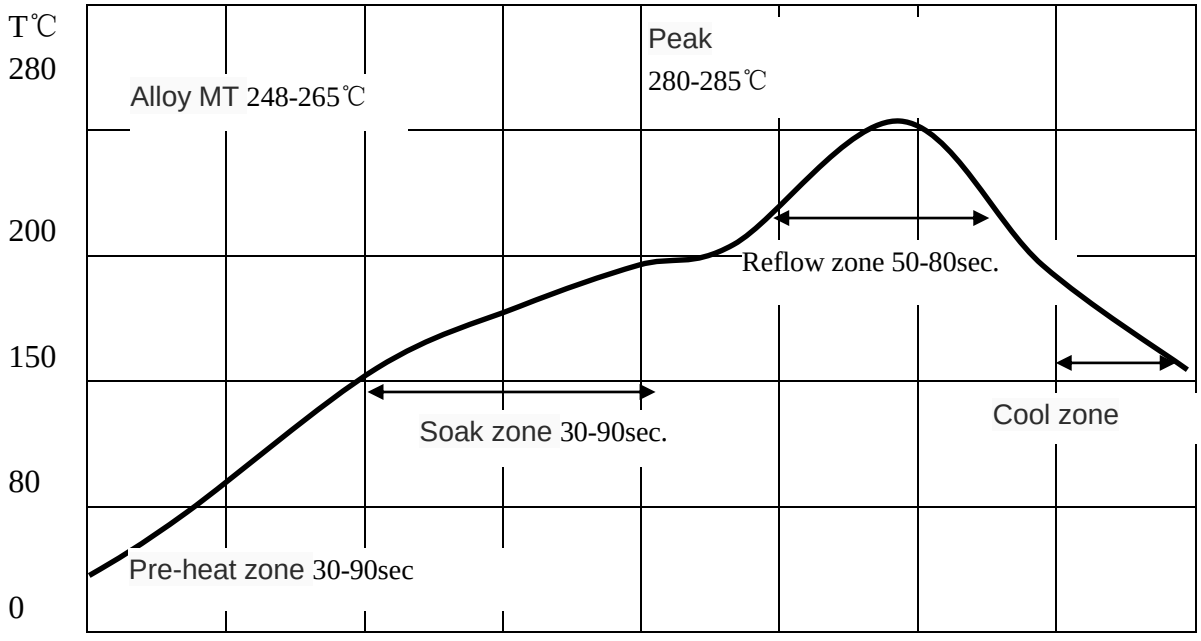
2. After curing

Feature	Result	Note
Thermal conductivity	42J/M.S.K	reference value
Electrical conductivity	12% of IACS	reference value
Tensile strength	44Mpa	reference value
Copper corrosion test	Pass	
Dryness test	Pass	
Solder ball test	Pass	
Wetting test	Pass	

四、 Soldering & curing process

Reflow oven ： Heat cure according to the reflow curve as shown below.

The below graph shows our recommended hot nitrogen reflow soldering process temperature curve. It can be used as a reflow furnace temperature setting. The temperature curve can effectively reduce the vertical flow of the solder paste and the forming of solder balls. For the vast majority of products and process conditions this is suitable. Furnace temperature would vary for different type and different components.



1. Pre-heat zone (25% to 33% of the heat channel) : In the pre-heat zone part of the volatile solvent in the solder

paste evaporates, reducing the thermal shock to the chip：Requirements: heating rate is 1.0 ~ 3.0 ℃ / s. If temperature goes up too fast, it may cause the flow moves and composition of the solder paste deterioration. Solder ball and bridging would occur. At the same time chips would receive damage under excessive thermal stress.

2. Soak zone (33% to 50% of the heating channel) : Flux became active in this region. Chemical cleaning action begins and make every bracket having uniform temperature before arriving back to reflow zone. Requirements: temperature: 150 ~200 ℃ time: 30 ~90seconds heat rising rate: < 2 ℃ / s.

3. Reflow zone: metal particles in the solder paste melts. Solder joint surface is formed under liquid surface tension: Requirement: The peak temperature: 280 ~ 285 ℃, above 260 ℃ for 20 ~ 50 seconds (Important), higher than 275 ℃ for 10 to 30 seconds. If the peak temperature too high or reflow time is too long, can lead to solder dimming, flux residues carbonization and discoloration or bracket and chip damage. If temperature is too low or reflow time is too short, you might lower the wettability of solder and cannot form a high quality of solder joint. Chips with solder joints having large heat capacity can even results for pseudo soldering.

4. Requirements: cooling rate < 4 ℃, the end temperature for cooling should be higher than 75 ℃; If the cooling rate is too fast, chips may be damaged by excessive thermal stress. Other bad phenomenons such as solder joint crack would also occur. If the cooling rate is too slow, large grain structure may form. This would worsen the strength of solder joint or leading to chip displacement.

5. **Note :**
   - The above temperature curve refers to the actual temperature of the solder joint position rather than the welding furnace heating temperature during setting (different).
   - The temperature curve are for reference only. It can be used as the user to find the basis of the optimal curve of different process application. Actual temperature setting should be combined with the product properties, stent size, chip distribution, characteristics, equipment and process condition factors. Sample tests should be done in advance to ensure the curve is optimized.
   - This series of solder paste can be used in addition to the above "heat - insulation" type heating mode. It can also be used in "warmed" type heating mode.

Requirements:

- The peak welding temperature is 30 ~ 50℃ higher than the melting point;
- heating rate <3℃/ s, all parts are heated evenly.

五、 Package and storage

1. Package: 500g/bottle, wide-mouth plastic (PE) bottle, sealed with inner lid and packaged in foam box.
2. Transport storage
   - Transport**:** Ice pack refrigerated transportation.
   - Storage：It should be stored in the refrigerator as soon as possible after receipt. The recommended storage

temperature is 0~10 ℃. If the temperature is too high, it will shorten its service life and affect its characteristics.

- Shelf life：6 months under normal sealed storage conditions of 0~10 ℃.
- Work time: Used within 24 hours after returning to temperature.
- Time from printing to reflow: the PCB shall be reflowed within 2hrs. after printing.

六、 Instructions

- Recovery method: don't open the bottle cap until the solder is close to room temperature, No more than two times of temperature return;
- Recovery time : Generally, paste should be removed from refrigeration 2~4 hours before use. Actual time to reach thermal equilibrium will vary with container size.
- Note: without enough "recovery", DO NOT open the bottle caps. DO NOT try to heat the paste to lower recovery time.
- Using environment: The best temperature for using the solder paste is 20 to 25 ℃, relative humidity 40-60% RH. Suggestions reflow soldering under nitrogen protection.

七、 Health and safety considerations

Note!

The following information is provided for users' reference only. Users should know clearly before using it.For details, please refer to the material safety data sheet (MSDS) of this product.

This product does not contain specific chemical substances that are regulated, nor does it contain organic solvents that are regulated in the Organic Solvent Toxicity Prevention Regulations. However, necessary precautions must be taken to ensure human health and safety. For products containing lead, the operation should be carried out in accordance with the Labor Safety and Health Act and lead poisoning prevention rules.

1. Solder paste is a chemical product that is mixed with a variety of chemical ingredients. should remember to avoid close smell of its smell, not to be edible.
2. In the welding process, part of the smoke generated by the flux in the solder paste will stimulate the respiratory system of the human body, which may cause discomfort if exposed to the exhaust gas for a long time or repeatedly. Therefore, it is necessary to ensure good ventilation in the operation site.
3. Necessary precautions should be taken to prevent the paste from touching the skin and eyes. In case of contact with the skin inadvertently, the place should be immediately cleaned with soap and water. If the tin paste contact the eyes carelessly, it shall be immediately washed with water for more than 10 minutes and sent to the hospital as soon as possible.
4. No eating or smoking is allowed in the course of homework. After homework, you must wash your hands with soap or warm water before eating.
5. Although the solvent system of this product has a very high flash point, it is still flammable and should be avoided. If you accidentally catch fire, use carbon dioxide or chemical dry powder fire extinguisher to extinguish the fire. Do not use water to extinguish the fire.
6. The waste solder paste and the cleaning cloth with solder adhesive stains after cleaning shall not be discarded at will. It shall be put into a sealed container and disposed of in accordance with relevant national and local regulations.