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SHENZHEN FITECH CO., LTD.

## Technical Data Sheet

Product Name: Solder Powder

Product Model: FL180

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## 1. Scope

This TDS mainly introduces FL180 model for SMT low temperature lead-free solder powder.

## 2. Reference standards

SJ/T 11391-2019 Solder powder for electronic soldering applications

IPC J-STD-005A Requirements for soldering pastes

IPC-TM-650 Test methods manual

## 3. Product composition

### a. Main element

Main element wt%			
Sn	Bi	Ag	X
56.0~58.0	41.0~43.0	0.9~1.2	0.1~1.0

### b. Impurity elements

Impurity elements max. wt%							
Pb	Cd	Fe	Ni	Zn	Al	As	Sb
0.03	0.002	0.02	0.01	0.001	0.001	0.03	0.05

### c. RoHS

RoHS					
Pb	Cd	Hg	Cr6+	PBB	PBDE
<300ppm	<20ppm	ND	ND	ND	ND

## 4. Physical characteristics

Melting point °C	141-169	Density g/cm <sup>3</sup>	8.3
Electrical conductivity % of IACS	7.5	Tensile strength MPa	92Mpa
hardness	20HB	Thermal conductivity	32J/M.S.K

## 5. Performance specifications

Item	T3		T4		T5 (15-25um)	
Appearance	Silver-grey powder		Silver-grey powder		Silver-grey powder	
Sphericity	≥95%		≥95%		≥95%	
PSD	>50um	<0.5%	>45um	<0.5%	>30um	<0.5%
	45-50um	<1%	38-45um	<1%	25-30um	<10%

	25-45um	≥90%	20-38um	≥90%	15-25um	≥80%
	<25um	<10%	<20um	<5%	<15um	<10%
Oxygen	≤100ppm		≤120ppm		≤150ppm	
Item	T6		T7		T8	
Appearance	Silver-grey powder		Silver-grey powder		Silver-grey powder	
Sphericity	≥95%		≥95%		≥95%	
PSD	>20um	<0.5%	>15um	<0.5%	>11um	<0.5%
	15-20um	<1.0%	11-15um	<1.0%	8-11um	<1.0%
	5-15um	≥90%	2-11um	≥90%	2-8um	≥90%
	<5um	<10%	<2um	<10%	<2um	<10%
Oxygen	≤400ppm		≤600ppm		≤800ppm	

## 6. Testing equipment and testing methods

Item	Testing equipment	Testing methods
Chemical composition	Arc-Spark OES	IPC-TM-650
Chemical composition	AAS	GB/T 10574.1-13-2003 GB/T 3260.1-11-2000
Sphericity	Electron microscope	SJ/T 11391-2019.B
PSD	Standard screen	IPC-TM-650 2.2.14
PSD	Laser particle size analyzer	Laser diffraction method
Oxygen	Oxygen analyzer	SJ/T 11391-2019.C

## 7. Product shelf life

It should be sealed and stored at room temperature (temperature ≤25°C, humidity ≤50%RH), shelf life: 4 months.

## 8. Test report

Each batch of products is tested according to the inspection sequence of composition, particle size, sphericity and oxygen content, and its results are recorded in the product quality report, which is attached to the product delivery.

## 9. Package

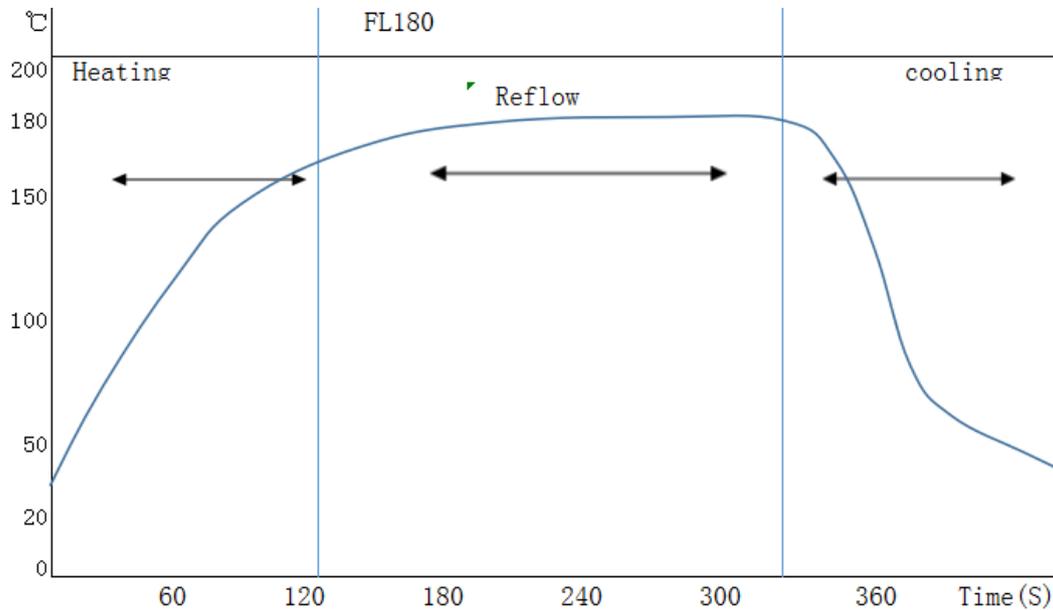
1Kg/bag, 5Kg/bag, packing according to customer's special requirements.

## 10. Note

- a. Store at room temperature and avoid exposure to sunlight.
- b. When used, the operating environment is controlled by temperature and humidity, and the temperature of tin powder before mixing the paste must be less than 25°C.
- c. In order to maintain good welding results, it is recommended to choose the appropriate flux, welding equipment and temperature.

## 11. Reflow curve

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.



Heating: 25~150°C, 2-3°C/sec

Reflow: >150°C, 180-240sec

Peak Temp: 180°C

Cooling: 2-4°C/sec

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).

☆ Temperature measurement at points 3-5 on the substrate。

- Front/back/middle/end of the substrate;
- Places where the component density is high/low;
- hot place/next to it;
- Weakly heat-resistant component leads and solid surfaces。

☆The temperature curve is 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.

Requirements:

- ① The peak temperature is  $180 \pm 5^{\circ}\text{C}$ ;
- ② heating rate ;  $< 3^{\circ}\text{C/s}$ , all parts are heated evenly.

12. Update the date: 2023-11-01