

SHENZHEN FITECH CO., LTD.

低温高强度锡膏 FL170 系列—规格书

Low temperature and high reliability solder paste series

FTP/FTD-170 系列 — FTP-1704、FTP-1705、FTP-1706、FTD-1704、FTD-1705、
FTD-1706

技术部

Technical Department

Technical Data Sheet

锡膏（Solder Paste）FTP/FTD-170 系

一、简介 Introduction:

FTP/FTD-170 系列低温锡膏采用球形度好，粒度均匀，氧含量低、高强度的福英达 FL170 低温专利合金焊粉及优良零卤助焊剂配制的优质锡膏，焊接过程中很少溶剂挥发，焊接后无锡珠产生残留少，焊点强度大，为低温焊接的理想材料，非常适用于低温度元器件的贴片，其润湿性好，焊点光亮饱满。

FTP/FTD-170 series low-temperature solder paste is a high-quality solder paste prepared by Fitech patent FL170 low-temperature high strength alloy solder powder with good sphericity, uniform particle size, low oxygen content and excellent zero-halogen flux. After soldering, no solder ball, less residual residue, high shear strength, it is an ideal materials for low-temperature soldering. They are very suitable for low-temperature components package, and have good solderability and bright solder joints.

二、产品特性及优势 Features and Advantages:

1. 回流峰值温度 170℃，焊接强度高,可靠性高
The peak temperature of reflow is 170 °C, and the jointing strength is good, high reliability.
2. 不含铋，绿色环保无铅焊料
No bismuth, green lead-free solder
3. 触变性好，粘度合适，调配不同的粘度可采用印刷、喷印、针转移、点胶等方式。
Good thixotropy, Appropriate viscosity, can be used to spray print, transfer, point glue needle, printing, etc.
4. 连续印刷时，其粘性变化极少，钢网上的可操作寿命长，超过 12 小时仍不会变干，仍保持良好的印刷效果。
When printing continuously, the viscosity change is very small, the operable life on the steel mesh is long, and it will not dry out after more than 12 hours, and still maintain good printing effect.
5. 具有极佳的焊接性能，可在不同部位表现出适当的润湿性。
It has excellent welding performance and can exhibit proper wettability in different parts.
6. 干燥后残留物少，无锡珠，焊点可靠性高。
After reflow, there are few residues, no solder balls, and the solder joints have high reliability.

三、技术特性: Technical feature

1. 未固化时特性: Before curing

产品性能 Feature	指标 Result	备注 Note
外观 Appearance	浅灰色 Light gray	膏状 Paste
金属填料类型 Alloy	SnBiAgX	
金属填料粒径 Powder size	FTP/FTD-1704 T4 20~38 μ m FTP/FTD-1705 T5 15~25 μ m FTP/FTD-1706 T6 5~15 μ m	类型 Printing Description
金属填料熔点 Alloy melting point	137~145 $^{\circ}$ C	
金属填料比例 Powder content	印刷型 Printing 90 \pm 2% 点胶型 Dispensing 86 \pm 2%	可进行调整 Adjustable
比重 Solder density	4.0~5.0	比重瓶
粘度 Viscosity	印刷型 Printing 140 \pm 20 Pa.s 点胶型 Dispensing 40 \pm 10 Pa.s	可按客户要求进行调整 Malcolm (10rpm)
触变指数 Ti	0.5 \pm 0.1	Lg(3rpm/30rpm)
卤素含量 Halogen Cl+Br	无卤 < 1000ppm	Halogen Free
润湿性 Wetting test	PASS 合格	J-STD-005
坍塌试验 Slump test	PASS 合格	J-STD-005
钢网印刷持续寿命 Stencil printing continuous life	>8H	In house
保质期 Shelf life	T4~T5: 6 month@ 0~10 $^{\circ}$ C T6: 4 month@ 0~10 $^{\circ}$ C	密封 Sealed storage

2. 固化后特性: After curing

性能 Feature	指标 Result	备注 Note
导热系数 Thermal conductivity	25 J/M.S.K	
导电率 Electrical conductivity	7.5% of IACS	
抗拉强度 Tensile strength	90Mpa	拉伸速率 2mm/min
铜板腐蚀性 Copper corrosion test	合格 Pass	
残留物干燥度 Dryness test	合格 Pass	
锡球测试 Solder ball test	合格 Pass	J-STD-005

四、焊接固化工艺：Soldering & curing process

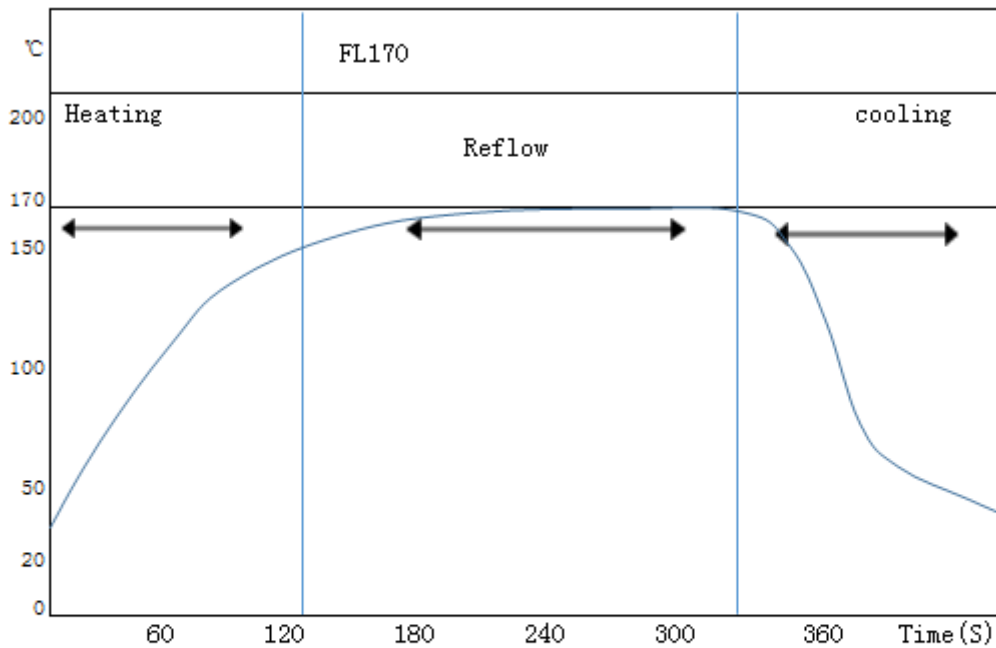
回流焊接固化：按下图回流曲线加热固化。

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

以下是我们建议的热风回流焊工艺所采用的温度曲线，可以用作回流焊炉温度设定之参考。该温度曲线可有效减少锡膏的垂流性以及锡球的发生，对绝大多数的产品和工艺条件均适用。不同炉型、不同元器件对炉温将会有所改变，我们建议在氮气保护氛围内进行回流焊接。

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: 25~140°C, 2-3°C/sec

Reflow: >150°C, 180-240sec

Peak Temp: 170°C

Cooling: 2-4°C/sec

注 Note

- ◆ 上述温度曲线是指焊点处的实际温度，而非回焊炉的设定加热温度（不同）

The above temperature curve refers to the actual temperature of the solder joint position rather than the welding furnace heating temperature during setting (different).

- ◆ 上述回焊温度曲线仅供参考，可作为使用者寻找在不同制程应用之最佳曲线的基础。实际温度设定需结合产品性质、支架大小、芯片分布状况及特点、设备工艺条件等因素综合考虑，事前不妨多做试验，以确保曲线的最佳化。

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.

- ◆ 本型号系列锡膏除可采用上述“升温-保温”型加热方式外，也可采用“逐步升温”型加热方式。
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.

要求: Requirements

- 回焊峰值温度为170℃；
Peak temperature of reflow solder is 170℃；
- 升温速率<3℃/秒，各部受热均匀。
The heating rate is smaller than 3 ℃ / sec. And it is evenly heated.

五、包装储存 Package and storage

1. 包装 Package

- ☞ 印刷型：500g/罐，宽口型塑胶（PE）瓶包装，并盖上内盖密封封装，送货时使用泡沫箱盛装。

Printing : 500g/bottle, wide-mouth plastic (PE) bottle, sealed with inner lid and packaged in foam box.

- 点胶型：EFD 针筒 10g/5cc、10g/10cc、20g/10cc 包装，可按客户要求进行包装，运输时采用冰袋、泡沫箱+纸箱包装。

Dispensing: The dispensing syringes are packed in 10g/5cc, 10g/10cc, 20g/10cc according to customer's requirements. They are packed in ice bags, foam boxes and cartons during transportation.

2. 运输储存 Transport storage

- 运输条件：冰袋冷藏运输；Transport :Ice pack refrigerated transportation.
- 储存条件：收到后应尽快将其放进冰箱储存，建议储存温度为0~10℃。温度过高会相应缩短其使用寿命，影响其特性。
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.

- 有效期限： 在0~10℃正常密封储存条件下，有效期为4 个月。

Selflife:4 months under normal sealed storage conditions of 0~1 0 °C.

- 工作时间: 建议回温后24小时内使用完毕。

Work time: Used within 24 hours after returning to temperature.

六、使用方法: Instructions

1. 回 温 Recovery:

锡膏通常要用冰箱冷藏, 温度为 0-10°C 为佳。故从冷箱中取出锡膏时, 其温度较室温低很多, 若未经“回温”, 而开启瓶盖, 则容易将空气中的水汽凝结, 并沾附于锡膏上, 在焊接时 (温度超过 150°C), 水份因受强热而迅速汽化, 造成“爆锡”现象, 产生锡珠, 甚至损坏元器件。

Solder paste is normally stored in a refrigerator with 0 ~ 10 °C. When solder paste is taken out of the cold box, its temperature is much lower than room temperature. If use without the recovery process varies damage may be caused to the paste. Opening the cap of sealing may cause water vapor in the air to condense on the paste. If this occurs, later in the reflow furnace (temperature over 150 °C), water would vaporize due to strong heat. This may lead to solder explosion and damage the chip.

2. 回温方式 Recovery method:

不开启瓶盖的前提下, 于室温中自然解冻;

Don't open the bottle cap until the solder paste is close to room temperature.

3. 回温时间 Recovery time :

室温下回温 2-3 小时, 达到热均衡所需要的实际时间因容器大小而异。

Generally, paste should be removed from refrigeration 2~3 hours before use. Actual time to reach thermal equilibrium will vary with container size.

注意! Note!

未经充足的“回温”, 不要打开瓶盖, 不要用加热的方式缩短“回温”的时间;

Without enough "recovery", DO NOT open the bottle caps. DO NOT try to heat the paste to lower recovery time.

4. 使用环境: 锡膏最佳使用环境温度为 20-25°C, 相对湿度 40-60%RH。建议在氮气保护环境下进行回流焊。

Using environment: The best temperature for using the solder paste is 20 to 25 °C, relative humidity 40-60% RH. Suggestions reflow soldering under nitrogen protection.

5. 可使用时间 Work time

a) 连续印刷时间 Continuous printing time

- 连续添加锡膏的场合: 8 小时;

When adding solder paste continuously: 8 hours

- 不连续添加锡膏の場合：4 小时。

When the solder paste is not continuously added :4 hours.

- b) 版上的锡膏快到 1/3（滚动径：10mm 以下）之前，请添加锡膏。

Add solder paste when it is about 1/3 on the plate (rolling diameter: 10mm or less).

- c) 锡膏被放置在版上的停留时间请在 3 小时内。

Solder paste should be placed on stencil within 3 hours.

- d) 印刷中断 30 分钟以上，请清洗模板。

Please clean the stencil if printing is interrupted for more than 30 minutes.

6. 印刷后的停留时间 Residence time after printing

锡膏印刷后，应尽快完成元器件的贴装，并过炉完成焊接，避免因搁置太久而导致锡膏表面变干，影响元件贴装及焊接效果，一般锡膏建议停留时间不超过 4 小时，低温含铋锡膏不超过 2 小时。若印刷中途休息 30 分钟以上或一时中断の場合，印刷模板需要清洗并在试印 1-2 块后进行生产。≤0.4mm 间隙开口部狭小地方、模板开口部旁边附有的焊膏会逐渐变干、印刷模板的脱落性也可能会随之变差。

After printing the solder paste, the components should be attached and welded as soon as possible, so as to avoid drying the surface of the solder paste and affecting the assembly and welding effect. Generally, it is recommended that the residence time of the solder paste shall not exceed 4 hours, and the low-temperature bismuth-containing solder paste shall not exceed 2 hours. If the printing break is more than 30 minutes or temporary interruption, the stencil needs to be cleaned. No more than 0.4mm pitch, the solder paste attached to the opening of the template will gradually dry out, and the shedding of the printing template may also become worse.

七、健康与安全方面应注意事项 Health and safety considerations

注意! Note!

以下资料仅提供给使用者作参考，用户在使用前应了解清楚。详细内容请查阅本品物料安全数据表(MSDS)。

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.

本制品不含受管制的特定化学物质，也不含有机溶剂中毒预防规则中所规制的有机溶剂，但仍需作必要的防范措施，以确保人体健康及安全。

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.

- i. 锡膏是一种化学产品，混合了多种化学成份，应切记避免近距离嗅闻其气味，更不可食用。

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.

- ii. 在焊接固化过程中，锡膏中的焊剂产生的部分烟雾会对人体的呼吸系统产生刺激，长时间或一再暴露在其废气中可能会产生不适，因此应确保作业现场通风良好，焊接设备必须安装充足的排气装置，将废气排走。

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.

- iii. 应有必要的防范措施避免锡膏接触皮肤和眼睛。若不慎接触到皮肤，则应立即用沾有酒精的布将该处擦干净，再用肥皂和清水彻底清洗干净。若不慎让锡膏接触眼睛，则需立即用清水冲洗 10 分钟以上，并尽快送医院医治。

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 an alcoholic cloth, and then thoroughly 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.

- iv. 作业过程中不允许饮食、抽烟，作业后须先用肥皂或温水洗手后才能进食。

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.

- v. 虽然本品之溶剂系统闪点较高，但仍然易燃，应避免接近火源。若不慎着火，可用二氧化碳或化学干粉、泡沫灭火器进行灭火，不可用水灭火。

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.

- vi. 废弃的锡膏和清理后沾有锡膏污渍的清洁布不能随意掉弃，应将其装入封密容器中，并按国家和地方的相关法规处置。

The waste solder paste and the cleaning cloth with solder paste 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.