

Pb-Free Solder Past TLF-Series

LFSOLDER TLF-series is Pb-free paste using Pb-free, spherical solder powder and special flux. As the paste contains no Pb, it will largely contribute to the protection of global environment. Furthermore, excellent reliability can be obtained with the flux without washing.

Outstanding Features :

- Pb-free (Sn/Ag/Cu series) solder alloy is used.
- Stable printability is obtained with little change in viscosity during continuous printing.
- Having a good solderability, adequate wettability is shown on various parts.
- Excellent solderability can be attained for a high peak temperature.
- Excellent printability with fine patterns can be obtained.(TLF-204-19)
- Usable in air-reflow and in N₂ reflow. (TLF-204-19)
- Chip-side balls seldom occur. (TLF-209-41)

Characteristics :

Item	TLF-204-19	TLF-204-41	Test Methods
Alloy composition	Sn96.5/Ag3.0/Cu0.5	Sn96.5/Ag3.0/Cu0.5	JIS Z 3282
Melting point	216~220	217~219	According to DSC measurement
Particle size of solder powder	20~38 μ m	20~41 μ m	According to laser diffraction method
Shape of solder powder	Spherical	Spherical	Annex 1 to JIS Z 3284
Flux content	11.8 %	11.4 %	JIS Z 3284
Chlorine content	0.0 %	0.0 %	JIS Z 3197
Viscosity	210 Pa's	200 Pa's	Annex 6 to JIS Z 3284 Viscometer, type PCU, at 25 , manufactured by Malcom
Water solution resistance test	More than 3×10 ⁴ cm	More than 1×10 ⁴ cm	JIS Z 3197
Insulation resistance test	More than 1×10 ⁹	More than 1×10 ⁹	Board type 2, Annex 3 to JIS Z 3284

Item	TLF-204-19	TLF-204-41	Test Methods
Slump test	Less than 0.20 mm	Less than 0.15 mm	Print the paste on ceramics board and heat for 60 seconds at 150 . Measure sagging width from before and after heating.
Solder ball test	Solder balls seldom occur	Solder balls seldom occur	Print the paste on ceramics board. After melting and heating, observe with a microscope of 50 times.
Solder spread test	More than 76 %	More than 76 %	JIS Z 3197 6.10
Copper plate corrosion test	No corrosion	No corrosion	JIS Z 3197 6.6.1
Tackiness test of residue	Pass	Pass	Annex 12 to JIS Z 3284

Quality Guarantee Period :

The quality guarantee period shall be 90 days after manufacture if the products are stored in sealed containers at temperature below 10 .

Product Packaging Units :

Containers	Packaging Units
Wide-mouthed polyethylene	500g, 1kg

Precautions :

- Preheat :
 - Set the temperature rising speed A at a rate of 2~4 /s. Careful about rapid temperature rise in preheat zone as it may cause excessive slumping of the solder paste.
 - Appropriate preheat time B will be from 60 to 120 seconds. If the preheat is insufficient, rather large solder balls tend to be generated. Conversely, if performed excessively, fine balls and large balls will generate in clusters at a time.
 - Appropriate preheat ending temperature C will be from 180 to 200 . If the temperature is too low, non-melting tends to be

caused in the area with large heat capacity after reflow.

- Heating :
 - Careful about sudden rise in temperature as it may worsen the slump of solder paste.
 - Set the peak temperature D in the range from 230 to 240 .
 - Adjust the melting time that the time over 220 , E will be from 20 to 40 seconds.
- Cooling :
 - Careful about slow cooling as it may cause the positional shift of parts and decline in joining strength at times.
 - Perform adequate test in advance as the reflow temperature profile will vary according to the conditions of parts and boards, and the specifications of the reflow furnace.

Cautions from Standpoints of Safety and Sanitation :

- Physiological interaction varies by individuals. As a prudent policy, therefore, care, should be exercised not to inhale gas or fume of solvent emitted during operations and not to have your skin exposed (especially mucous membrane and other parts vulnerable to stimuli) for a long time.
- This paste contains the organic solvent, but it is not flammable.
- If the paste sticks to the skin, wipe it off with ethanol and the like, and wash thoroughly with soapy water.

* The flux ingredients in the paste contain nonionic halogen based activator.

* The physical chemistry-character among written contents, etc. is not a guarantee value. The evaluation of danger and noxiousness is based and makes material, information, and the data, etc. which can be acquired now. However, it is not because all material was covered and not handled enough, please. As for notes, it is the one intended for usual handling. Special handling is not assumed. Please observe the restriction of related various regulations, and use after executing suitable safety measures for the usage. Before using it in your company, it is related with process conditions or reliability. Please conduct sufficient examination surely performed.