MULTICORE

Technical Data Sheet

LF 318

June 2022

PRODUCT DESCRIPTION

LF 318 provides the following product characteristics:

Technology	Solder paste
Application	Pb-free soldering

LF 318 solder paste is a halide-free, no clean, pin testable Pb-free solder paste, formulated to have excellent humidity resistance and a broad process window, both for reflow and printing. This product has a high tack force to resist component movement during high speed placement and long printer abandon times. **LF 318** shows excellent solderability over a wide range of reflow profiles in both air and nitrogen across a wide range of surface finishes including Ni/Au, Immersion Sn, Immersion Ag and OSP copper.

FEATURES AND BENEFITS

- Good humidity resistance. Gives excellent coalescence even after 72 hours exposure to 27ºC/80% RH, reducing process variation due to environmental factors.
- Clear residues for easy post-reflow inspection.
- Soft, non-stick, pin testable residues allow easy in-circuit testing.
- Suitable for fine pitch, high speed printing up to 150mm/s (6"/s).
- Extended open time and tack-life leading to low wastage.
- Halide-free flux classification: ROL0 to ANSI/J-STD-004.

TYPICAL PROPERTIES

Based on Type 3 powder .

Solder Paste Typical Properties

Alloys	96SC, 97SC
Powder Particle Size, µm	25-45
Powder Size Coding	AGS
Metal Loading (Weight %)	88.5
Brookfield Viscosity TF spindle, 25°C, 5rpm after 2 minutes, mPa·s	765,000
Thixotropic Index (Ti), 25°C (Ti = log(viscosity @ 1.8s^{-1} / viscosity @ 18s^{-1})	0.54
Malcom Rheology, 10rpm, 25°C, Rate 6s^{-1}	1,961
Slump, J-STD-005, mm *RT, 15 minutes* 0.33 x 2.03 mm pads 0.63 x 2.03 mm pads *150°C, 15 minutes* 0.33 x 2.03 mm pads 0.63 x 2.03 mm pads	IPC A21 Pattern 0.06 0.33 0.25 0.41
Initial tack force,g mm^{-2}	2.0
Useful open time, hours	>24

Based on T4 powder .

Solder Paste Typical Properties

Powder Size Coding	DAP
Metal Content, %	88.5
Brookfield Viscosity @ 25ºC, mPa.s (cP) Spindle TF, Speed 5 rpm, 2 minutes	886,000
Malcom Viscosity @ 25 °C, Pa.s Speed 10 rpm	195.6
Malcom Thixotropic Index	0.45
IPC Slump , mm *150°C, 15 minutes* 0.33 x 2.03, mm pads 0.63 x 2.03, mm pads	 0.25 0.41

Solder Powder:

Careful control of the atomisation process for production of solder powders for **LF 318** solder pastes ensures that the solder powder is produced to a quality level that exceeds IPC/J-STD-006 & EN29453 requirements for sphericity, size distribution, impurities and oxide levels. Minimum order requirements may apply to certain alloys and powder sizes.

DIRECTIONS FOR USE

Printing:

1. **LF 318** is available for stencil printing down to 0.4mm (0.016") pitch devices, with type Type 3 (AGS) powder.
2. Printing at speeds between 25mm/s (1.0"/s) and 150mm/s (6"/s) can be achieved by using laser cut and electro-polished, electro-formed stencils, metal squeegees (preferably 60°).
3. Acceptable first prints have been achieved at 0.4mm (0.016") pitch after printer down times of 240 minutes without requiring a knead cycle.

Reflow:

- Any of the available methods of heating to cause reflow may be used including IR, convection, hot belt, vapor phase and laser soldering.
- **LF 318** is not sensitive to reflow profile type.
- No single reflow profile is deemed suitable for all processes and applications, but the following example profiles have given good results in practice.

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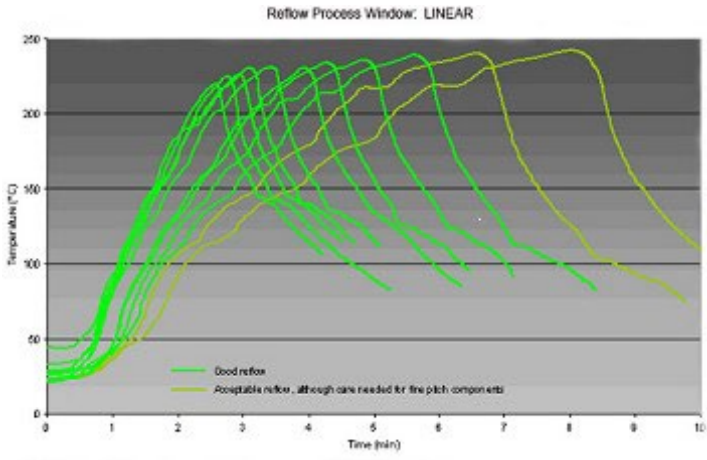
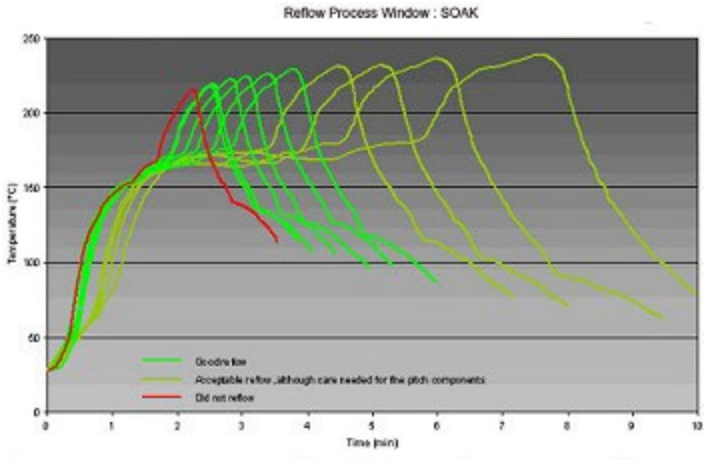
Profile 1:



Profile 2:



Cleaning:

1. **LF 318** solder pastes are no-clean and are designed to be left on the PCB in many applications post-assembly since they do not pose a hazard to long-term reliability.
2. Residue removal can be achieved using conventional cleaning processes based on solvents such as MCF 800 or suitable saponifying agents.
3. For stencil cleaning and cleaning board misprints, MSC 01 solvent cleaner is recommended.

RELIABILITY PROPERTIES

Solder Paste Medium:

LF 318 medium includes a stable resin system with slow evaporating solvents and minimal odor. The formulation has been tested to the requirements of Telcordia (formerly known as Bellcore) GR-78-CORE and ANSI/J-STD-004B for a type ROL0 classification specification.

Test	Specification	Results
Copper Plate Corrosion	ANSI/J-STD-004	Pass
Copper Mirror Corrosion	ANSI/J-STD-004	Pass
Chlorides & Bromides	ANSI/J-STD-004	Pass
Surface Insulation Resistance (without cleaning)	ANSI/J-STD-004	Pass
	Telcordia GR-78-Core	Pass
	JIS-Z-3248	Pass
Flux Activity Classification (without cleaning)	ANSI/J-STD-004	ROL0

STORAGE AND SHELF LIFE

Storage:

It is recommended to store **LF 318** at 0 to 10°C. (NB cartridges should be stored tip down to prevent the formation of air pockets). The paste should be removed from cold storage a minimum of 8 hours before use. Do not use forced heating methods to bring solder paste up to temperature. **LF 318** has been formulated to minimize flux seperation on storage but should this occur, gentle stirring for 15 seconds will return the product to it's correct rheological performance. To prevent contamination of unused product, do not return any material to its original container. For further specific shelf life information, contact your nearest HARIMA location.

Shelf Life:

Provided **LF 318** is stored tighly sealed in its original container at 0 to 10°C, a minimum shelf life of 183 days can be expected. Air shipment is recommended to minimize the time the containers are exposed to higher temperatures.

DATA RANGES

The data contained herein may be reported as a typical value and/or a range. Values are based on actual test data and are verified on a periodic basis.

GENERAL INFORMATION

For safe handling information on this product, consult the Material Safety Data Sheet (MSDS).

Not for Product Specifications

The technical information contained herein is intended for reference only. Please contact your nearest HARIMA location for assistance and recommendations on specifications for this product.

Conversions

(°C x 1.8) + 32 = °F
kV/mm x 25.4 = V/mil
mm / 25.4 = inches
µm / 25.4 = mil
N x 0.225 = lb
N/mm x 5.71 = lb/in
N/mm² x 145 = psi
MPa x 145 = psi
N·m x 8.851 = lb·in
N·m x 0.738 = lb·ft
N·mm x 0.142 = oz·in
mPa·s = cP

Disclaimer

Note:

The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. The product can have a variety of different applications as well as differing application and working conditions in your environment that are beyond our control. HARIMA is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product. Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

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