

**LOCTITE LF 318**

November 2014

**PRODUCT DESCRIPTION**

LOCTITE LF 318 provides the following product characteristics:

Technology	Solder paste
Application	Pb-free soldering

LOCTITE 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. LOCTITE 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 27°C/80% RH, reducing process variation due to environmental factors.
- Colorless 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
Slump, J-STD-005, mm <i>RT, 15 minutes</i>	IPC A21 Pattern
0.33 x 2.03 mm pads	0.06
0.63 x 2.03 mm pads	0.33
<i>150°C, 15 minutes</i>	
0.33 x 2.03 mm pads	0.25
0.63 x 2.03 mm pads	0.41
Brookfield Viscosity TF spindle, 25°C, 5rpm after 2 minutes, mPa·s	765,000
Thixotropic Index (Ti), 25°C ( $T_i = \log(\text{viscosity } @ 1.8\text{s}^{-1}) / \log(\text{viscosity } @ 18\text{s}^{-1})$ )	0.54
Malcom Rheology, 10rpm, 25°C, Rate 6s <sup>-1</sup>	1,961
Initial tack force,g mm <sup>-2</sup>	2.0
Useful open time, hours	>24

**Solder Powder:**

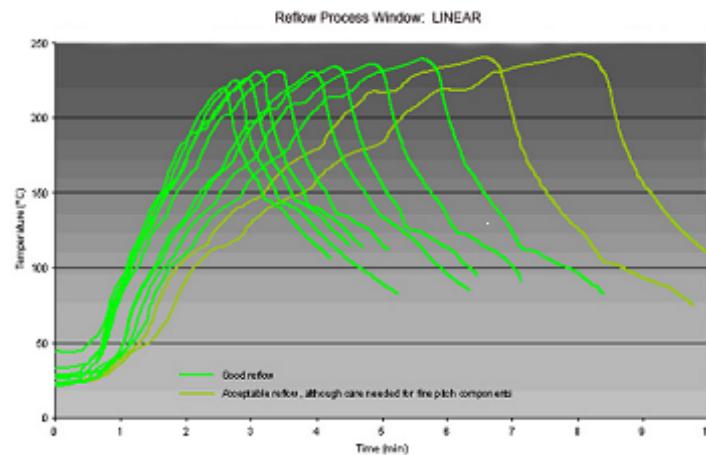
Careful control of the atomisation process for production of solder powders for LOCTITE LF 318 solder pastes ensures that the solder powder is produced to a quality level that exceeds IPC/J-STD-006 & EN29453 requirements for sphericity, size distribution, impurities and oxide levels. Minimum order requirements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

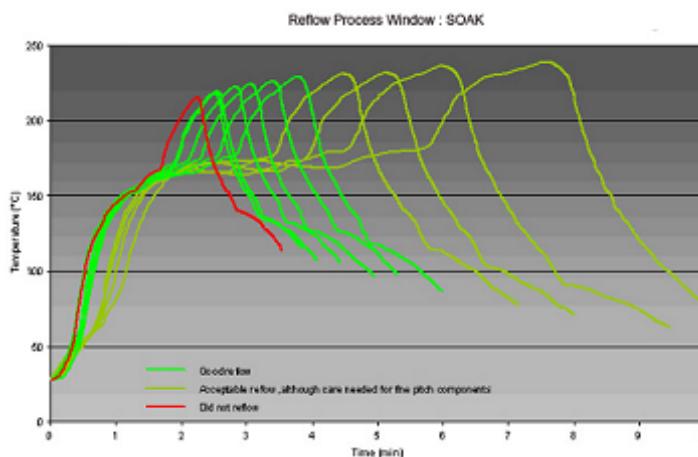
**DIRECTIONS FOR USE****Printing:**

1. LOCTITE 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.
- LOCTITE 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.

**Profile 1:**

**Profile 2:****Cleaning:**

1. LOCTITE 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 LOCTITE MCF 800 or suitable saponifying agents.
3. For stencil cleaning and cleaning board misprints, LOCTITE MSC 01 solvent cleaner is recommended.

**RELIABILITY PROPERTIES****Solder Paste Medium:**

LOCTITE 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)	Telcordia GR-78-Core JIS-Z-3248	Pass
Flux Activity Classification (without cleaning)	ANSI/J-STD-004	ROL0

**STORAGE AND SHELF LIFE****Storage:**

It is recommended to store LOCTITE 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. LOCTITE LF 318 has been formulated to minimize flux separation on storage but should this occur, gentle stirring for 15 seconds will return the product to its 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 local Technical Service Center.

**Shelf Life:**

Provided LOCTITE LF 318 is stored tightly 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 Henkel Technologies Technical Service for assistance and recommendations on specifications for this product.

**Conversions**

$$\begin{aligned}
 (\text{°C} \times 1.8) + 32 &= \text{°F} \\
 \text{kV/mm} \times 25.4 &= \text{V/mil} \\
 \text{mm} / 25.4 &= \text{inches} \\
 \mu\text{m} / 25.4 &= \text{mil} \\
 \text{N} \times 0.225 &= \text{lb} \\
 \text{N/mm} \times 5.71 &= \text{lb/in} \\
 \text{N/mm}^2 \times 145 &= \text{psi} \\
 \text{MPa} \times 145 &= \text{psi} \\
 \text{N}\cdot\text{m} \times 8.851 &= \text{lb-in} \\
 \text{N}\cdot\text{m} \times 0.738 &= \text{lb-ft} \\
 \text{N}\cdot\text{mm} \times 0.142 &= \text{oz-in} \\
 \text{mPa}\cdot\text{s} &= \text{cP}
 \end{aligned}$$

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**Reference 2**