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# LF620M

August 2011

## PRODUCT DESCRIPTION

LF620M provides the following product characteristics:

<b>Technology</b>	Solder paste
<b>Application</b>	Pb-free soldering

LF620M is a halide-free, no clean, low voiding Pb-free solder paste, which has excellent humidity resistance and a broad process window both for printing and reflow. LF620M has been formulated to give low voiding in BGA joints, a high tack force to resist component movement during high speed placement, long printer abandon times and excellent solderability over a wide range of reflow profiles in air and nitrogen and across a wide range of surface finishes including Ni/Au, Immersion Sn, Immersion Ag and OSP Copper.

## FEATURES AND BENEFITS

- Excellent print process capability for 0.4 mm pitch CSP
- Long abandon time capability (>1 hour on 0.4 mm CSP)
- Allows fast print speed with low print pressure
- Humidity resistance - excellent coalescence after 8 hours exposure to 27°C/80% RH
- Colorless residues for easy post-reflow inspection
- Very low voiding
- Halide free flux classification: ROL0 to ANSI/J-STD-004.

## TYPICAL PROPERTIES

Based on type 4 powder.

### Solder Paste Typical Properties

Alloys	97SC
Powder Particle Size, $\mu\text{m}$	38 - 20
Multicore Powder Size Coding	DAP
IPC Equivalent	Type 4
Metal Loading (Weight %)	88.7
Slump, J-STD-005, mm	IPC A21 Pattern
<i>RT, 15 minutes</i>	
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	0.2
0.63 x 2.03 mm pads	0.33
Brookfield Viscosity TF spindle, 25°C, 5rpm after 2 minutes, mPa·s	626,000
Thixotropic Index (Ti), 25°C ( $T_i = \log(\text{viscosity @ } 1.8\text{s}^{-1}) / \text{viscosity @ } 18\text{s}^{-1}$ )	0.56
Malcom Rheology, 10rpm, 25°C, Rate $6\text{s}^{-1}$	1,220
Initial tack force, gF	2.4
Useful open time, hours	>24

## Solder Powder:

Careful control of the atomisation process for production of solder powders for LF620M 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, for availability contact your local technical service helpdesk.

## DIRECTIONS FOR USE

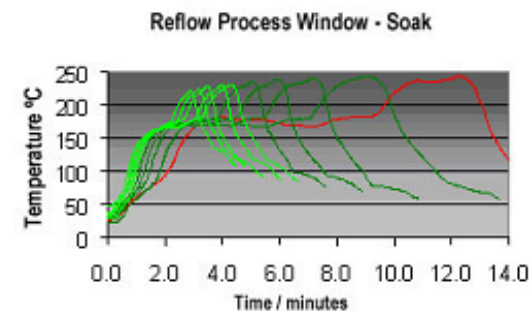
### Printing:

1. LF620M is available for stencil printing down to 0.4mm (0.016") pitch CSP devices, with type 4 (DAP) powder.
2. Printing at speeds between 70mm/s (0.1"/s) and 130mm/s (6"/s) can be achieved using laser cut, electropolished or electroformed stencils and metal squeegees (preferably 60°).
3. Acceptable first prints have been achieved at 0.4mm (0.016") pitch after printer down times of  $\geq 60$  minutes without requiring a knead cycle.

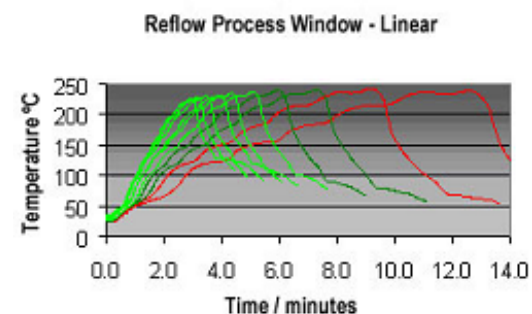
### Reflow:

- LF620M is not particularly sensitive to reflow profile type.
- There is no single reflow profile which is suitable for all processes and applications, but the following graphs show profile examples that have given good results in practice.

### Profile 1:



### Profile 2:



**Cleaning:**

1. LF620M 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. However, should there be a specific requirement for residue removal, this may be achieved using conventional cleaning processes based on solvents such as MCF800 or suitable saponifying agents.
3. For stencil cleaning and cleaning board misprints, SC-01/02 Solvent cleaner is recommended.

**RELIABILITY PROPERTIES**

**Solder Paste Medium:**

LF620M medium contains a stable resin system and slow evaporating solvents. The formulation has been tested to the requirements of the ANSI/J-STD-004 for a type ROL0 classification specifications.

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
Flux Activity Classification (without cleaning)	ANSI/J-STD-004	ROL0

**PACKAGING**

**Containers:** LF620M is supplied in:

- 500g plastic jars with an air seal insert
- 600g Semco cartridges

Other packaging types may be available on request; please contact your local technical service helpdesk for assistance.

**Storage:**

It is recommended to store LF620M 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. LF620M has been formulated to minimize flux separation on storage but should this occur, gentle stirring for 15 seconds will return the product to the 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.

**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**

- (°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/mm<sup>2</sup> 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

**Note**

The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof. In light of the foregoing, **Henkel Corporation and its affiliates ("Henkel") specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel products. Henkel specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits.** The discussion herein of various processes or compositions is not to be interpreted as representation that they are free from domination of patents owned by others or as a license under any Henkel patents that may cover such processes or compositions. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide. This product may be covered by one or more United States or foreign patents or patent applications.

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Reference 0.1