

**PRODUCT DESCRIPTION**

LF620 provides the following product characteristics:

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

LF620 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. It shows low hot slump to minimize the possibility of bridging and mid-chip solder balling. This product has high tack force to resist component movement during high speed placement and 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**

- 4 hours between print abandon time even on small CSP apertures.
- Very low hot slump.
- Colorless residues for easy post-reflow inspection.
- Suitable for fine pitch, high speed printing up to 150mm/s (6"/s).
- Halide free flux classification: ANSI/J-STD-004 for a type ROL0 classification.

**TYPICAL PROPERTIES**

Based on type 3 powder.

**Solder Paste Typical Properties**

Alloys	96SC, 97SC
Powder Particle Size, $\mu\text{m}$	45-20
Multicore Powder Size Coding	AGS
IPC Equivalent	Type 3
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	0.15
0.63 x 2.03 mm pads	0.33
Brookfield Viscosity TF spindle, 25°C, 5rpm after 2 minutes, mPa·s	580,000
Thixotropic Index (Ti), 25°C ( $Ti = \log(\text{viscosity @ } 1.8\text{s}^{-1} / \text{viscosity @ } 18\text{s}^{-1})$ )	0.48
Malcom Rheology, 10rpm, 25°C, Rate $6\text{s}^{-1}$	1,370
Initial tack force, gF	28
Useful open time, hours	>24

Based on type 4 powder.

**Solder Paste Typical Properties**

Alloys	96SC, 97SC
Powder Particle Size, $\mu\text{m}$	38 - 20
Multicore Powder Size Coding	DAP
IPC Equivalent	Type 4
Metal Loading (Weight %)	89.0
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	0.15
0.63 x 2.03 mm pads	0.33
Brookfield Viscosity TF spindle, 25°C, 5rpm after 2 minutes, mPa·s	774,000
Thixotropic Index (Ti), 25°C ( $Ti = \log(\text{viscosity @ } 1.8\text{s}^{-1} / \text{viscosity @ } 18\text{s}^{-1})$ )	0.48
Malcom Rheology, 10rpm, 25°C, Rate $6\text{s}^{-1}$	1,730
Initial tack force, gF	46
Useful open time, hours	>24

**Solder Powder:**

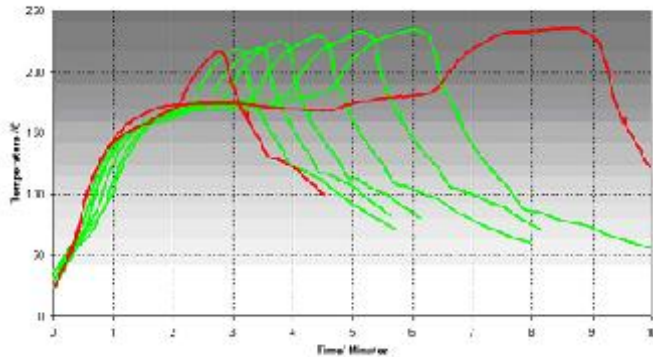
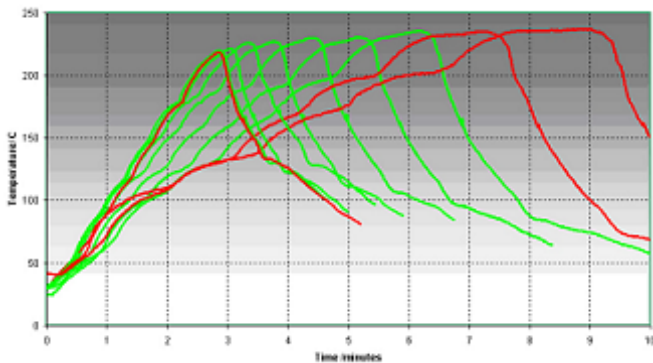
Careful control of the atomisation process for production of solder powders for LF620 solder pastes ensures that the solder powder is produced to a quality level that exceeds IPC/J-STD-006 & EN29453 requirements for sphericity, size distribution, impurities and oxide levels. Minimum order requirements may apply to certain alloys and powder sizes, for availability contact your local technical service helpdesk.

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

1. LF620 is available for stencil printing down to 0.4mm (0.016") pitch QFP devices, with type 3 (AGS) powder and 0.4mm CSP apertures with type 4 (DAP) powder.
2. Printing at speeds between 25mm/s (1.0"/s) and 150mm/s (6"/s) can be achieved using laser cut and electro-polished, electroformed 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.
- LF620 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 graph shows example profiles that have given good results in practice.

**Profile 1:****Profile 2:****Cleaning:**

1. LF620 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 Solvent cleaner is recommended.

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

LF620 medium contains a stable resin system and slow evaporating solvents. The formulation has been tested to the requirements of the Telcordia (formerly known as Bellcore) GR-78-CORE and 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	ANSI/J-STD-004	Pass
Resistance (without cleaning)	Telcordia GR-78-Core	Pass
	JIS-Z-3248	Pass
Flux Activity Classification (without cleaning)	ANSI/J-STD-004	ROL0

**PACKAGING**

**Containers:** LF620 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 LF620 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. LF620 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.

**Shelf Life:**

Provided LF620 is stored tightly sealed in the original container at 0 to 10°C, a minimum shelf life of 6 months 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 Corporation Technical Service for assistance and recommendations on specifications for this product.

**Conversions**

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$   
kV/mm  $\times 25.4 = \text{V/mil}$   
mm / 25.4 = inches  
 $\mu\text{m} / 25.4 = \text{mil}$   
N  $\times 0.225 = \text{lb}$   
N/mm  $\times 5.71 = \text{lb/in}$   
N/mm<sup>2</sup>  $\times 145 = \text{psi}$   
MPa  $\times 145 = \text{psi}$   
N·m  $\times 8.851 = \text{lb}\cdot\text{in}$   
N·m  $\times 0.738 = \text{lb}\cdot\text{ft}$   
N·mm  $\times 0.142 = \text{oz}\cdot\text{in}$   
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 specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel Corporation 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 Corporation 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