

**PRODUCT DESCRIPTION**

LF700™ provides the following product characteristics:

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

LF700™ solder paste is a halide-free, no clean, Pb-free solder paste, which has a broad process window for printing, reflow and humidity resistance. LF700™ 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 >75 minutes on 0.4 mm CSP.
- Allows fast print speed with low print pressure.
- Humidity resistance - gives excellent coalescence even 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  | 96SC, 97SC          |
| Powder Particle Size, µm  | 20 to 38 & 25 to 45 |
| Multicore Powder Size Coding  | DAP and AGS         |
| IPC Equivalent  | Type 4 and Type 3   |
| Metal Loading (Weight %)  | 88.5                |
| Slump, J-STD-005, mm<br><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   | 0.33                |
| Brookfield Viscosity TF spindle, 25°C, 5rpm after 2 minutes, mPa·s  | 550,000 to 900,000  |
| Thixotropic Index (Ti), 25°C (PCU205)<br>( $T_i = \log(\text{viscosity @ } 1.8s^{-1} / \text{viscosity @ } 18s^{-1})$ ) | 0.57 to 0.69        |
| Malcom Viscosity, 10rpm, 25°C, Poise (PCU205)   | 1,150 to 1,600      |
| Initial tack force, g mm <sup>2</sup>   | 2.4                 |
| Useful open time, hours   | >24                 |

\* Slump data is expressed as the minimum spacing between pads of the size shown that does not exhibit bridging

\*\* Tack data are derived from comparative laboratory tests and do not necessarily relate directly to a particular user's conditions

**Solder Powder:**

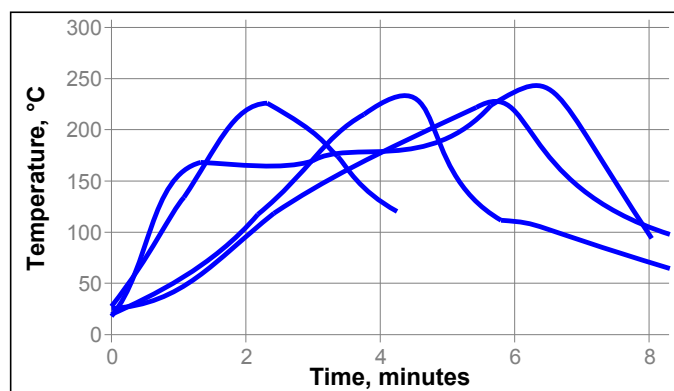
Careful control of the atomisation process for production of solder powders for LF700™ solder pastes ensures that the solder powder is produced to a quality level that exceeds IPC/J-STD-006 & EN29453 requirements for sphericity, size distribution, impurities and oxide levels. Minimum order requirements may apply to certain alloys and powder sizes, for availability contact your local technical service helpdesk.

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

LF700™ is available for stencil printing down to 0.4mm (0.016") pitch devices, with type 4 (DAP) powder. Printing at speeds between 70mm/s (0.1"/s) & 150mm/s (6"/s) can be achieved using laser cut and electro-polished, electroformed stencils, metal squeegees (preferably 60°). Acceptable first prints have been achieved at 0.4mm (0.016") pitch after printer down times of 75 minutes without requiring a knead cycle.

**Reflow:**

Any of the available methods of heating to cause reflow may be used including IR, convection and hot belt. LF700™ 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.

**Cleaning:**

LF700™ solder paste is no-clean and is designed to be left on the PCB in many applications post assembly, since it does not pose a hazard to long term reliability. 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. For stencil cleaning and cleaning board misprints, SC-01™ Solvent cleaner is recommended.

## RELIABILITY PROPERTIES

### Solder Paste Medium:

LF700™ 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<br>JIS-Z-3248 | Pass    |
| Flux Activity Classification (without cleaning)  | ANSI/J-STD-004               | ROL0    |

## PACKAGING

**Containers:** LF700™ 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 LF700™ 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. Multicore™ LF700™ 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 Multicore™ LF700™s are 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 Technologies Technical Service for assistance and recommendations on specifications for this product.

## Conversions

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

## 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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