Technical Data Sheet

LF320

June 2006

LEAD-FREE SOLDER PASTE

PRODUCT DESCRIPTION

Multicore™ LF320 solder paste requires a minimum peak reflow temperature of only 229°C and is suitable for reflow in both air & nitrogen atmospheres. This minimises the likelihood of damage to components through the thermal shock associated with higher peak temperatures. If required (for example with large ΔT assemblies) higher peak reflow temperatures may be employed. Multicore LF320 solder paste is available with 96SC & 97SC SnAgCu alloys. Other Pb-free alloys may be available on request.

FEATURES AND BENEFITS

- Low peak temperature requirement minimises risk of damage to components
- High solderability makes LF320 compatible with a wide range of finishes
- Very low voiding
- Suitable for fine pitch, high speed printing up to 150mm/s (6”/s)
- Extended abandon time, open time and tack-life leading to low wastage.
- Low colour post reflow residues for easy visual inspection.
- Halide free flux classification: ROL0 to ANSI/J-STD-004

TYPICAL PROPERTIES

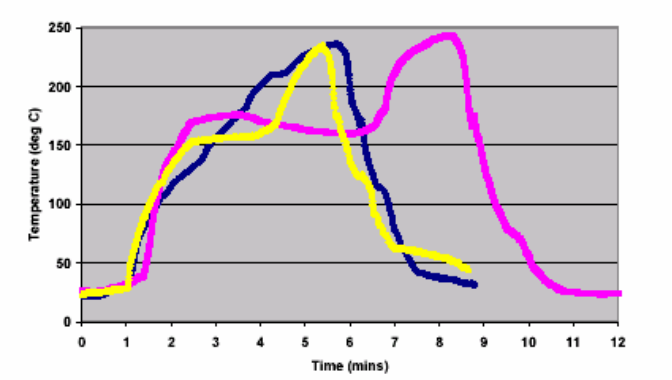
Based upon type 3 powder; other sizes also available.

Properties	Printing Grade	Dispensing Grade	Proflow Grade
Alloy	96SC, 97SC		
Metal Content, %	88	84	88.5
Powder Particle Size, µm	45 - 20		
Powder Particle Size, J-STD-005	Type 3		
Multicore Powder Size Coding	AGS		
Viscosity measured at 25ºC (Typical) Brookfield, cP[1] Malcom, P[2] Thixotropic Index (Ti)[3]	 760,000 2170 0.43	 458 000 633 0.51	 820,000 2170 0.52
Slump, J-STD-005, mm[4] 1Hr @ RT 0.7mm pads 1Hr @ RT 1.5mm pads 20min @ 80ºC 0.7mm pads 20min @ 80ºC 1.5mm pads	 0.2 0.2 0.3 0.3	 N/A 	 0.2 0.2 0.3 0.3
Tack[5] Initial tack force, gmm^{-2} Useful open time, hours	 1.6 >24	 1.3 >24	 1.6 >24

[1] Measured at 25°C, TF spindle at 5rpm after 2 minutes
[2] Measured at 25°C, and a shear rate of 6s^{-1}
[3] TI = log (viscosity at 1.8s^{-1}/Viscosity at18s^{-1})
[4] Slump data are expressed as the minimum spacing between pads of the size shown that does not allow bridging
[5] 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 LF320 solder pastes ensures that the solder powder is produced to a quality level that exceeds IPC/J-STD006 & EN29453 requirements for sphericity, size distribution, impurities and oxide levels. Minimum order requirements may apply to certain alloys and powder particle sizes. For availability with other alloys and powder sizes, contact your local technical service helpdesk.

Reflow:
Any of the available methods of heating to cause reflow may be used including IR, convection, hot belt, vapour phase and laser soldering. LF320 is not particularly sensitive to reflow profile type. There is no single reflow profile which is suitable for all processes & applications, but the following table shows example profiles that have given good results in practice.



Cleaning: Multicore LF320 solder paste are no-clean & are designed to be left on the PCB in many applications since they do 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 Multicore MCF800, or suitable saponifying agents. For stencil cleaning and cleaning board misprints, Multicore SC-01 Solvent Cleaner is recommended.

RELIABILITY PROPERTIES

Solder paste medium: Multicore LF320 medium contains a stable resin system and slow evaporating solvents with minimal odour. The formulation meets the requirements of the Telcordia BellcoreGR-78-CORE and ANSI/J-STD-004 for a type ROL0 classification.

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 Bellcore GR-78-Core	Pass Pass
Electromigration (without cleaning)	Bellcore GR-78-Core	Pass
Flux Activity Classification (without cleaning)	ANSI/J-STD-004	ROL0

DIRECTIONS FOR USE

Printing: Multicore LF320 solder paste is available for stencil printing down to 0.4mm (0.016") pitch devices, with type 3 (AGS) powder. Printing at speeds between 20mm/s (1.0″/s) & 150mm/s (6"/s) can be achieved using laser cut, electro-polished, or electroformed stencils and metal squeegees (preferably 60^0). Unlike many solder pastes, high squeegee pressures are not required, making LF320 particularly suited for second side printing processes.

Acceptable first prints have been achieved at 0.4mm (0.016") pitch after printer down times of up to 240 minutes, without requiring a knead cycle.

PACKAGING

Containers: Multicore LF320 solder paste is supplied in:

- 500g plastic jars with an air seal insert.
- 1kg, 600g or 500g Semco cartridges
- 40g/10cc or 100g/30cc Musashi & Semco syringes for dispensing

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

Storage

It is recommended to store LF320 at 0-10°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 prior to use. Do not use forced heating methods to bring solder paste up to temperature. Multicore LF320 solder paste 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 Centre.

Shelf Life:

Provided Multicore LF320 solder pastes are stored tightly sealed in the original container at 0-10°C, a minimum shelf life of 6 months can be expected. Air shipment is recommended to minimize the time that containers are exposed to higher temperatures.

DATA RANGES

The data contained herein may be reported as a typical value and/or 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).

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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