Technical Data Sheet

LF328 Solder Paste

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LOW-VOIDING LEAD-FREE SOLDER PASTE

PRODUCT DESCRIPTION

Multicore™ LF328 solder paste is a halide-free, no clean, Pb-free solder paste, which has a broad process window, for printing, reflow and humidity resistance. LF328 solder paste 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 0.5mm and 0.4mm pitch CSP
- Long abandon time capability (>75minutes on 0.4mm CSP)
- Allows fast print speed with low print pressure
- Humidity resistance – excellent coalescence after 8 hours exposure to 27ºC/80% RH.
- Colorless residues for easy post-reflow inspection
- Ultra-low voiding
- Halide free flux classification: ROL0 to ANSI/J-STD-004

TYPICAL PROPERTIES

Properties	LF328			
Alloys	96SC (SAC387, 95.5Sn 3.8Ag 0.7Cu, 217°C) 97SC (SAC305, 96.5Sn 3.0Ag 0.5Cu, 217°C)			
Powder Particle Size, µm	20-45		20-38	
Multicore Powder Size Coding	AGS		DAP	
IPC Equivalent	Type 3		Type 4	
Metal Loading (% weight)	88	88.5	88	88.5
Slump, J-STD-005, mm[4]	IPC A21 Pattern			
RT (15 minutes)				
0.33 x 2.03 mm pads	0.06			
0.63 x 2.03 mm pads	0.33			
150ºC (15 minutes)				
0.33 x 2.03 mm pads	0.20			
0.63 x 2.03 mm pads	0.33			
Viscosity measured at 25°C (Typical)				
Brookfield, cP[1]	440,000	526,000	490,000	530,000
Malcom 10rpm, P[2]	880	953	920	1020
Thixotropic Index (Ti)[3]	0.55	0.56	0.54	0.54
Tack[5]				
Initial tack force, gmm^{-2}	1.8		2.4	
Useful open time, hours	>24		>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 at$18s^{-1}$)
(4) Slump data (AGS 88%only) 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

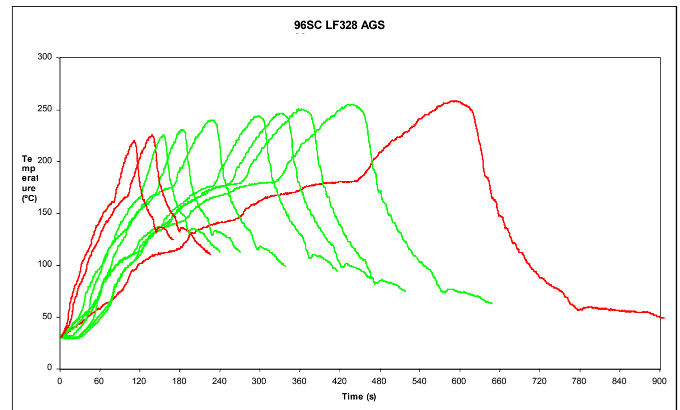
Solder powder: Careful control of the atomisation process for production of solder powders for LF328 solder pastes ensures that the solder powder is produced to a quality level that exceeds IPC/J-STD006 & EN29453 requirements for sphericity, size distribution & impurities. Minimum order requirements may apply to certain alloys and powder particle sizes. For availability with other alloys and powder sizes, contact your local technical service helpdesk.

DIRECTIONS FOR USE

Printing: LF328 solder paste is available for stencil printing down to 0.4mm (0.016") pitch BGA devices, with type 4 (DAP) powder. Printing at speeds between 25mm/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).

Excellent first prints have been achieved on 0.4mm (0.016") pitch CSP pads 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, hot belt, vapour phase and laser soldering. LF328 is not particularly sensitive to reflow profile type. There is no single reflow profile which is suitable for all processes & applications, but the following graph shows example profiles (in green) that have given good results in practice.



Cleaning: Multicore LF328 solder pastes 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.

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.

RELIABILITY PROPERTIES

Solder paste medium: Multicore LF328 medium contains a stable resin system and slow evaporating solvents with minimal odour. The formulation meets the requirements of the Telcordia (formerly known as Bellcore) GR-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 Telcordia GR-78-Core JIS-Z-3284	Pass Pass Pass
Flux Activity Classification (without cleaning)	ANSI/J-STD-004	ROL0

PACKAGING

Containers: Multicore LF328 solder paste 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 LF328 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 4 hours prior to use. Do not use forced heating methods to bring solder paste up to temperature. Multicore LF328 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 LF328 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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