

**PRODUCT DESCRIPTION**

WS300™ provides the following product characteristics:

Application	Soldering
Cure	Reflow
Technology	Lead-Free Solder Paste

WS300™ is a lead-free water washable solder paste for printing and reflow in air or nitrogen atmospheres where process yield is critical. WS300™ solder paste offers excellent open time and good soldering activity over a wide range of reflow profiles and surface finishes. WS300™ is available with 96SC & 97SC SnAgCu alloys. Other Pb-free alloys may be available on request.

FEATURES AND BENEFITS

- Effective over a wide range of printer cycle times and print speeds
- Excellent printer open time and between print abandon time
- Long component tack time
- Excellent slump resistance
- Effective over a wide range of reflow profiles in air or nitrogen
- Residues removed with deionised water rinse

TYPICAL PROPERTIES**Solder Paste Typical Properties**

Alloys	96SC, 97SC
Alloy melting range (°C)	217
Multicore Powder Size Coding	AGS
ANSI/J-STD-005	Type 3
Powder Particle Size, µm	20-45µ
Metal Loading (Weight %)	87
Malcom Viscosity, P at 6 s ⁻¹ @ 25°C	1,530
Brookfield Viscosity TF spindle, 25°C, 5rpm after 2 minutes, mPa·s	590,000
Thixotropic Index (Ti), 25°C (Ti = log(viscosity @ 1.8s ⁻¹ / viscosity @ 18s ⁻¹)	0.68
Slump, J-STD-005, mm <i>RT, 15 minutes</i> 0.33 x 2.03 mm pads 0.63 x 2.03 mm pads <i>150°C, 15 minutes</i> 0.33 x 2.03 mm pads 0.63 x 2.03 mm pads	IPC A21 Pattern 0.15 0.33 0.15 0.33
Initial tack force, gF	39.5

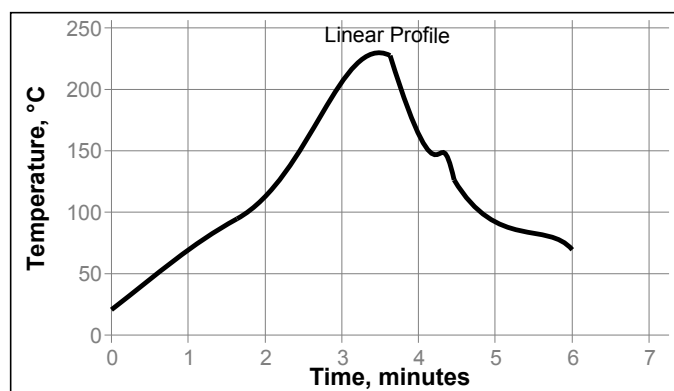
Solder Powder:

Careful control of the atomisation process for production of solder powders for WS300™ 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**Reflow:**

WS300™ has been formulated for reflow in air over a wide range of temperature profiles. A minimum peak temperature of 230-235°C is required. The diagram below shows a reflow profile that has been used successfully. Other profiles may also give good results, depending on board design factors.

NOTE: If boards and/or component leads carrying tin/lead finishes are reflowed with this lead-free solder paste, reflow profiles with lower peak temperatures may possibly be used. The resulting joints will have the same solidification temperature as and similar reliability performance to the Sn62 alloy. This combination of materials is perfectly acceptable but of course does not yield a lead-free assembly.



Due to the higher melting point of lead free alloy relative to Sn62/63, reflow places increased demand on paste thermal stability. High air flow rates give as even a temperature distribution as possible. However, across the board, this may contribute to exhaustion of paste activity. WS300™ combines excellent printing characteristics with tolerance of hot profiles and high air flow rates, although extreme (long & hot) profiles may still give sub-optimal reflow and cleaning in some oven types.

As with all solder pastes, reflow may be carried out in nitrogen if this is installed and this is likely to lessen the effects of long hot profiles and high gas circulation rates.

Application:

WS300™ lead free solder paste is designed for high volume stencil printing applications with component lead pitches down to 0.4 mm with the AGS (Type 3) powder size. Conventional metal blade squeegees may be used with a contact angle of 60 ° and sweep speeds of 25 mm sec⁻¹ up to 150 mm sec⁻¹. The best printing performance will be obtained under these conditions. The product can in some cases tolerate slow print cycle times because the material resists drying on the stencil and therefore blocking the stencil apertures. There are various methods for testing the ability of a paste to perform after an extended idle time on the stencil and each can produce different times before printing deteriorates. In a real process environment, the paste has been left idle for more than 1 hour and still produced a perfect first print.

Component Placement:

The paste shows good tack behavior and is capable of holding components in place before reflow. Components may be placed several hours after printing, although this is naturally dependent on the ambient conditions.

Cleaning: WS300™ residues are designed to be removed from assemblies in an aqueous cleaner without the use of any additional chemistries and/or saponifiers. Incomplete removal of the residues can lead to reduced reliability of the device. Hot deionised water is the preferred cleaning agent. Residues are easily removed in batch and in-line aqueous cleaners even up to 3 days after reflow. Cleaning of some assemblies is best conducted in an ultrasonic bath. Tap water is not recommended for rinsing since ionic impurities present in tap water can lead to reduced reliability of the assembly.

RELIABILITY PROPERTIES**Solder Paste Medium:**

WS300™ medium contains a stable resin system and includes solvents with high boiling ranges. The formulation has been tested to the requirements of the specifications.

Test	Specification	Results
Surface Insulation	ANSI/J-STD-004	Pass
Resistance (with cleaning)	Telcordia GR-78-Core	Pass
Electromigration (cleaned)	Telcordia GR-78-Core	Pass

PACKAGING

Containers: WS300™ is supplied in:

- 500g plastic jars with an air seal insert
- 650g and 1300g Semco cartridges

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

Shelf Life:

Provided WS300™ 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.

WS300™ solder paste has been formulated to reduce separation on storage to a minimum but should it occur, gentle stirring for 15 seconds will return the product to its correct rheological performance

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**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.

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.

Reference 0.1

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