



MP200 Solder Paste

February 2005

HIGH-SPEED PRINTING, NO-CLEAN SOLDER PASTE

PRODUCT DESCRIPTION

Multicore™ MP200 solder pastes have been formulated as no-clean solder pastes for high speed printing and reflow in both air and nitrogen. The products were specifically formulated to have increased reflow process window.

- Suitable for fine pitch, high speed printing up to 200mm/s¹.
- Extended printer open time and tack-life.
- Prolonged between print abandon time.
- Essentially colorless residues
- Soft residues make pin testing easier eliminating any need for cleaning.
- Resistant to both hot and cold slump.
- 63S4 alloy for Anti-Tombstoning
- ROL0 TO ANSI/J-STD-004

63S4 ANTI-TOMBSTONING ALLOY

Where tombstoning is a particular process problem then 63S4 alloy may offer an instant solution. 63S4 alloy is a blend of different melting point alloys with a special mix of solder particle sizes. This modification extends the melting range of the alloy hence reducing the possibility that one solder deposit at a component termination can fully reflow before the other.

TYPICAL PROPERTIES

Properties	MP200			
Alloy	Sn63 Sn62		63S4	
Metal Content, %	90		90	
Powder Particle Size, μm	45-25		38-10	
Powder Particle Size, J-Std-005	Type 3		N/A	
Powder Particle Size, Multicore Code	AGS		ACP	
Viscosity measured at 25°C	680,000		680,000	
Brookfield, $\text{P}^{(1)}$	1350		1400	
Malcolm / $\text{p}^{(2)}$	0.61		0.58	
Thixotropic Index, $\text{TI}^{(3)}$				
Slump, J-Std-005 ⁽⁴⁾	Horizontal pads		Vertical Pads	
8 mils stencil.	80 x 25 mil	80 x 25 mil	80 x 13 mil	80 x 13 mil
Room temp	13 mil	13 mil	3.2 mil	3.2 mil
150°C	13 mil	13 mil	3.2 mil	3.2 mil
4 mils stencil	80 x 13 mil	80 x 13 mil	80 x 8 mil	80 x 8 mil
Room temp	3.2 mil	3.2 mil	3.0 mil	3.0 mil
150°C	3.2 mil	3.2 mil	3.0 mil	3.0 mil
Tack ⁽⁵⁾				
Initial tack force, gmm^{-2}	1.1			
Useful open time, hours	>24 hr			
Shelf Life	6 months refrigerated			

⁽¹⁾ Measured at 25°C, TF spindle at 5rpm after 2 minutes (typical)

⁽²⁾ Measured at 25°C, and a shear rate of 6s^{-1} (typical)

⁽³⁾ $\text{TI} = \log(\text{viscosity at } 1.8\text{s}^{-1} / \text{viscosity at } 18\text{s}^{-1})$

⁽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 MP200 solder pastes ensures that the solder powder is produced to a level that exceeds IPC/J-STD006 & EN29453 requirements for size distribution, impurities & oxide levels. Minimum order requirements may apply to certain alloys and powder particle sizes.

DIRECTIONS FOR USE

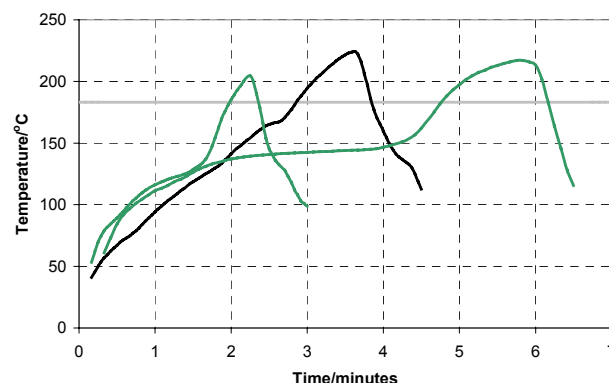
Printing: MP200 solder pastes containing standard type (AGS) solder powder are formulated for high-volume stencil printing applications with component lead pitches down to 0.4 mm. Printing at speeds between 25mm/s (1"/s) & 8"/s (200 mm/s) can be achieved using laser cut, electro-polished, or electroformed stencils and metal squeegees (preferably 60°). Unlike some pastes, high squeegee pressures are not required (typically 0.5 to 1.0 lbs. per inch), making MP200 particularly useful for second side printing processes.

Acceptable first prints have been achieved at 16 mils (0.4 mm) pitch after printer down times of greater than 90 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. It is not practicable to recommend an ideal reflow temperature profile for all situations; however, the following shows examples profiles that have given good results in practice. Where tombstone defects are experienced with standard alloys and it is not possible to eliminate them by design changes then the 63S4 anti-tombstoning should be selected. Generally 63S4 alloy paste is a drop-in replacement for standard Sn63 or Sn62 alloys and in many cases no reflow process changes will be required. Note that the joint surface appearance of the 63S4 alloy is slightly less bright than those obtained from Sn62 and Sn63 alloys, the effect is marginal and is due to the small melting range of the alloy.

Typical reflow profile

1. Ramp to 130 to 165°C at no more than 2°C s^{-1} .
2. Hold at 130 to 165°C for 60 – 120 seconds.
3. Ramp to peak reflow temperature at no more than 2°C s^{-1} .
4. Recommended peak reflow temperature is 205°C to 225°C.
5. Dwell time above liquidus of 30-75 seconds.



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.

TYPICAL RELIABILITY PROPERTIES

Multicore MP200 flux medium contains a stable resin system and slow evaporating solvents with little or no odor. The final formulation meets the requirements of the Bellcore GR-78-Core and ANSI/J-Std-004 for a type ROL0 classification. The reliability data for MP200 is summarized in the following table.

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

GENERAL INFORMATION

For safe handling information consult the material safety datasheet (MSDS)

Lead exposure is harmful to your health. Lead is a toxic metal that produces a range of diverse health effects. Rosins contained in solder paste are potential sensitizers.

CLEANING

Multicore MP200 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.

PACKAGING

MP200 solder pastes are supplied in:

- Various package sizes and types are available.
- Manual Repair Paste for Sn62/63 in 30cc syringes for manual dispense only
- Tacky Flux in various package sizes

STORAGE:

It is recommended to store MP200 at 5-10°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 MP200 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 Center.

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SHELF-LIFE:

Provided Multicore MP200 solder pastes are stored tightly sealed in the original container at 5-10°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. Short-term storage at room temperature during use is acceptable providing the paste is sealed in original containers. Laboratory testing has shown that the paste remains in a useable condition after two months of storage at room temperature (<23°C).

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.

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.