



# MP200

December 2011

## PRODUCT DESCRIPTION

MP200 provides the following product characteristics:

<b>Technology</b>	Solder paste
<b>Application</b>	Sn/Pb soldering

MP200 solder pastes have been formulated as no-clean, Sn/Pb solder paste for high speed printing and reflow in both air and nitrogen. The product was specifically formulated to have increased reflow operating window.

## FEATURES AND BENEFITS

- Suitable for fine pitch, high speed printing up to 200mm/s<sup>-1</sup>
- Extended printer open time and tack life
- Long abandon time
- 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
- Halide free flux classification: ROL0 to ANSI/J-STD-004 (Jan. 1995)

## TYPICAL PROPERTIES

Based on type 3 powder.

### Solder Paste Typical Properties

Alloys	SN62, SN63
Powder Particle Size, µm	25-45
Multicore Powder Size Coding	AGS
IPC Equivalent	Type 3
Metal Loading (Weight %)	90% metal
Slump J-STD-005, mm	IPC A21 Pattern
<i>RT, 15 minutes</i>	
0.33 x 2.03 mm pads	0.08
0.63 x 2.03 mm pads	0.33
<i>150°C, 15 minutes</i>	
0.33 x 2.03 mm pads	0.08
0.63 x 2.03 mm pads	0.33
Brookfield Viscosity TF spindle, 25°C, 5rpm after 2 minutes, mPa·s	680,000
Thixotropic Index (Ti), 25°C (Ti = log(viscosity @ 1.8s <sup>-1</sup> / viscosity @ 18s <sup>-1</sup> )	0.61
Malcom Rheology, 10rpm, 25°C, Rate 6s <sup>-1</sup>	1,350
Initial tack force, gF	86.4
Useful open time, hours	>24

## 63S4 ANTI-TOMBSTONING ALLOY

63S4 alloy offers an instant solution where tombstoning is a particular process problem. 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 reducing the possibility that one solder deposit at a component termination can fully reflow before the other.

## Solder Paste Typical Properties

Alloys	63S4
Multicore Powder Size Coding	ACP
Metal Loading (Weight %)	90% metal
Slump, J-STD-005, mm	IPC A21 Pattern
<i>RT, 15 minutes</i>	
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	0.08
0.63 x 2.03 mm pads	0.33
Brookfield Viscosity TF spindle, 25°C, 5rpm after 2 minutes, mPa·s	680,000
Thixotropic Index (Ti), 25°C (Ti = log(viscosity @ 1.8s <sup>-1</sup> / viscosity @ 18s <sup>-1</sup> )	0.58
Malcom Rheology, 10rpm, 25°C, Rate 6s <sup>-1</sup>	1,400
Initial tack force, gF	86.4
Useful open time, hours	>24

## 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 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

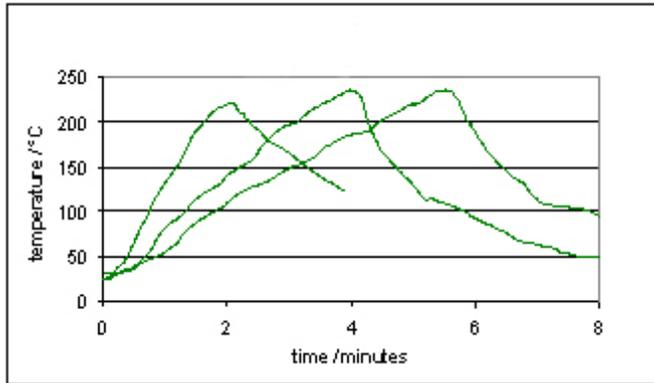
### Printing:

1. MP200 is available for stencil printing down to 0.4mm (0.016") pitch QFP devices, with type 3 (AGS) powder.
2. Printing at speeds between 25 mm/s (1 "/s) and 200 mm/s (8 "/s) can be achieved using laser cut, electropolished or electroformed stencils and metal squeegees (preferably 60°).
3. Unlike some pastes, high squeegee pressures are not required, making Multicore MP200 particularly useful for second side printing processes.
4. Acceptable first prints have been achieved at 0.4 mm (16 mils) pitch after printer down times of >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.
- There is no single reflow profile which is suitable for all processes and applications, but the following graphs show profile examples that have given good results in practice.
- 63S4 anti-tombstoning is selected when tombstone defects are experienced with standard alloys and when it is not possible to eliminate by design changes..
- Typical reflow profile as follows:

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



#### Cleaning:

1. MP200 solder pastes are no-clean and are designed to be left on the PCB in many applications post assembly, since they do not pose a hazard to long term reliability.
2. 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.
3. For stencil cleaning and cleaning board misprints, SC-01 Solvent cleaner is recommended.

#### RELIABILITY PROPERTIES

##### Solder Paste Medium:

MP200 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.

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	Pass
Electromigration	Telecordia GR-78-Core	Pass
Flux Activity Classification (without cleaning)	ANSI/J-STD-004 (Jan. 1995)	ROLO

#### PACKAGING

**Containers:** MP200 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 MP200 at 5 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. MP200 has been formulated to minimize flux separation on storage but should this occur, gentle stirring for 15 seconds will return the product to the 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 MP200 is stored tightly sealed in the original container at 5 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. Short term storage at room temperature during use is acceptable provided the paste is sealed in original containers. Laboratory testing has shown that the paste remains in a useable condition after 2 months of storage at room temperature.

#### 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 and its affiliates ("Henkel") specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel products. Henkel 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 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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Reference **N/A**