

LOCTITE MP 100

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PRODUCT DESCRIPTION

LOCTITE MP 100 provides the following product characteristics:

Technology	No-clean Solder paste
Application	Pb-based soldering

LOCTITE MP 100 solder paste has been formulated as a pale, soft residue product for printing and reflow in air, where process yield is critical. This material offers excellent open time, greatly extended abandon times and good soldering activity over a wide range of reflow profile types and surface finishes.

FEATURES AND BENEFITS

- Effective over a wide range of printer cycle times and squeegee speeds
- Extended "between-print" abandon time
- Highly suitable for enclosed squeegee systems (vacuum packed version)
- Version suitable for ultra-fine pitch and 0201chips
- Long component tack time
- Resists solder balling
- Excellent spread on a wide range of solderable surfaces
- Effective over a wide range of reflow profiles in air or nitrogen
- Soft, non-sticky post reflow residues for reduced maintenance in-circuit electrical testing
- Low color post-reflow residues for easy visual inspection

TYPICAL PROPERTIES

Solder Powder:

The solder powders for LOCTITE MP 100 solder pastes are produced by atomizing alloys conforming to the purity requirements of ANSI/JSTD-006 and EN29453. The anti-tombstoning alloy 63S4 meets the specification of Sn63 except for a deliberate addition of 0.4% silver.

Careful control of production processes ensures that the solder powder is at least 97% spherical (aspect ratio < 1.5) and contains less than the minimum level of contaminants that would adversely affect solder paste performance. A typical maximum oxide contamination level of 80 ppm (expressed as oxygen in the solder) is regularly achieved or improved.

Particle Size Distribution (PSD) (J-STD 005A)

Henkel Powder Description	Powder Particle Size Distribution	IPC EQUIVALENT
AGS	45-20 µm	Type 3
ADP	38-15 µm	Type 3.5
ACP	45-15 µm	N/A

Solder Alloy (J-STD 006)

Henkel Code	Alloy	Melting Point, °C	Ag %
Sn62	Industry Standard	179	2.0
Sn63	Industry Standard	183	0
63S4	Henkel Proprietary	179 to 183	0.4

Based on Type 3 powder

Solder Paste Typical Properties

Alloys	Sn62, Sn63
Application Type	Squeegee
Metal Content, %	89.5
Brookfield Viscosity @ 25 °C, mPa·s Spindle TF, speed 5 rpm, after 2 minutes	610,000
Malcom Viscosity @ 25°C, Pa·s @ Shear Rate of 6 s ⁻¹	1,350
Thixotropic Index (Ti) Ti = log (1.8/18 s ⁻¹)	0.66
Slump, IIV test method, mm RT, 1 hour	
0.7 x 0.7 mm pads	0.2
1.5 x 1.5mm pads	0.2
80°C, 20 minutes	
0.7 x 0.7 mm pads	0.2
1.5 x 1.5 mm pads	0.2
Slump, IPC Test Method, mm RT	
0.63 mm pads	0.33 / 0.33
0.23mm pads	0.06 / 0.1
150°C	
0.63 mm pads	0.41 / 0.48
0.23 mm pads	0.06 / 0.1
Tack	
Initial tack force, g mm-2	1.4
Useful open time, hours	>72

Based on Type 3 powder

Solder Paste Typical Properties

Alloys	Sn62, Sn63
Application Type	Squeegee
Metal Content, %	90
Brookfield Viscosity @ 25 °C, mPa·s Spindle TF, speed 5 rpm, after 2 minutes	680,000
Malcom Viscosity @ 25°C, Pa·s @ Shear Rate of 6 s ⁻¹	1,540
Thixotropic Index (Ti) Ti = log (1.8/18 s ⁻¹)	0.68
Slump, IIV test method, mm RT, 1 hour	
0.7 x 0.7 mm pads	0.2
1.5 x 1.5mm pads	0.2
80°C, 20 minutes	
0.7 x 0.7 mm pads	0.2
1.5 x 1.5 mm pads	0.2
Tack	
Initial tack force, g mm-2	1.1
Useful open time, hours	>72

Based on Type 3 powder**Solder Paste Typical Properties**

Alloys	Sn62, Sn63
Application Type	Enclosed head printing
Metal Content, %	90
Brookfield Viscosity @ 25°C, mPa.s Spindle TF, Speed 5 rpm, 2 minutes	800,000
Malcom Viscosity @ 25°C, Pa.s @ Shear Rate of 6 s ⁻¹	1,660
Thixotropic Index (Ti) Ti = log (1.8/18 s ⁻¹)	0.67
Slump, IIV test method, mm RT, 1 hour	
0.7 x 0.7 mm pads	0.2
1.5 x 1.5mm pads	0.2
80°C, 20 minutes	
0.7 x 0.7 mm pads	0.2
1.5 x 1.5 mm pads	0.2
Tack	
Initial tack force, g mm-2	1.1
Useful open time, hours	>72

Based on Type 3.5 powder**Solder Paste Typical Properties**

Alloys	Sn62, Sn63
Application Type	Squeegee
Metal Content, %	90
Brookfield Viscosity @ 25°C, mPa.s Spindle TF, Speed 5 rpm, 2 minutes	700,000
Malcom Viscosity @ 25°C, Pa.s @ Shear Rate of 6 s ⁻¹	1,600
Thixotropic Index (Ti) Ti = log (1.8/18 s ⁻¹)	0.7
Slump, IIV test method, mm RT, 1 hour	
0.7 x 0.7 mm pads	0.2
1.5 x 1.5mm pads	0.2
80°C, 20 minutes	
0.7 x 0.7 mm pads	0.2
1.5 x 1.5 mm pads	0.2
Tack	
Initial tack force, g mm-2	1.2
Useful open time, hours	>72

Based on Henkel Proprietary Powder**Solder Paste Typical Properties**

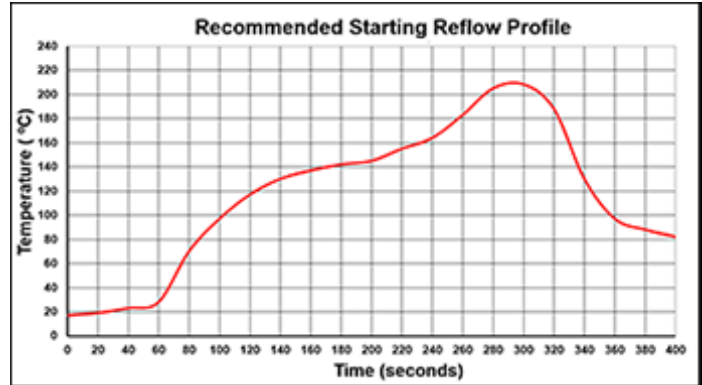
Alloys	63S4
Application Type	Anti-tombstone
Metal Content, %	90
Brookfield Viscosity @ 25°C, mPa.s Spindle TF, Speed 5 rpm, 2 minutes	740,000
Malcom Viscosity @ 25°C, Pa.s @ Shear Rate of 6 s ⁻¹	1,720
Slump, IIV test method, mm RT, 1 hour	
0.7 x 0.7 mm pads	0.2
1.5 x 1.5mm pads	0.2
80°C, 20 minutes	
0.7 x 0.7 mm pads	0.2
1.5 x 1.5 mm pads	0.2
Thixotropic Index (Ti) Ti = log (1.8/18 s ⁻¹)	0.64
Tack	
Initial tack force, g mm-2	1.1
Useful open time, hours	>72

DIRECTIONS FOR USE**Application:**

1. LOCTITE MP 100 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.
2. Conventional metal blade squeegees may be used with a contact angle of 60° and sweep speeds of 20 mm sec⁻¹ up to 150 mm sec⁻¹.
3. 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.
4. 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.
5. In a real process environment, paste that has been left idle for more than 1 hour will still produce a perfect first print for 0.4 mm pitch pads at 150 mm s⁻¹ squeegee speed.
6. LOCTITE MP 100 products for enclosed head squeegee systems should be specified at the time of ordering since they are prepared and packed to ensure optimum performance in this type of equipment.

Reflow:

LOCTITE MP 100 has been formulated for reflow in air over a wide range of temperature profiles. The diagram below shows an example reflow profile that has been used successfully. Other profiles may also give good results, depending on board design factors.

**Cleaning:**

LOCTITE MP 100 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.

RELIABILITY PROPERTIES**Solder Paste Medium:**

LOCTITE MP 100 medium contains a stable resin system, slow evaporating solvents and with minimal odor. The formulation has been tested to the requirements of the IPC IPC-SF-818 and Bellcore specifications.

Test	Specification	Results
Corrosion	DTD 599-A	Pass
	IPC-SF-818	Pass
	BS 5625	Pass
Copper Mirror Corrosion	IPC-SF-818	Pass
Chromate paper test	IPC-SF-818	Pass
Surface Insulation	IPC-SF-819	Pass
Resistance (SIR) (without cleaning)	J-STD-004	Pass
	GR-78-CORE	Pass
Electromigration (ECM) (without cleaning)	GR-78-CORE	Pass
Flux Activity Classification	IPC-SF-818	Pass
	J-STD-004	Pass
	EN29454	Pass

STORAGE AND SHELF LIFE

Storage:

Provided LOCTITE MP 100 is stored tightly sealed in its original containers at 0 to 10°C, a minimum shelf life of 183 days can be expected. Air shipment is recommended to minimize the time the container are exposed to higher temperatures. The material 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.

LOCTITE MP 100 solder paste has been formulated to minimize flux separation on storage but should this occur, gentle stirring for seconds will return the product to the correct rheological performance. It is recommended that cartridges are stored vertically with the cartridge tip facing downwards. To prevent contamination of unused product, do not return any material to its original container.

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

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$
 $\text{kV/mm} \times 25.4 = \text{V/mil}$
 $\text{mm} / 25.4 = \text{inches}$
 $\mu\text{m} / 25.4 = \text{mil}$
 $\text{N} \times 0.225 = \text{lb}$
 $\text{N/mm} \times 5.71 = \text{lb/in}$
 $\text{N/mm}^2 \times 145 = \text{psi}$
 $\text{MPa} \times 145 = \text{psi}$
 $\text{N}\cdot\text{m} \times 8.851 = \text{lb}\cdot\text{in}$
 $\text{N}\cdot\text{m} \times 0.738 = \text{lb}\cdot\text{ft}$
 $\text{N}\cdot\text{mm} \times 0.142 = \text{oz}\cdot\text{in}$
 $\text{mPa}\cdot\text{s} = \text{cP}$

Disclaimer

Note:

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Reference **N/A**