

# LOCTITE MP 102

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## PRODUCT DESCRIPTION

LOCTITE MP 102 provides the following product characteristics:

<b>Technology</b>	No-clean Solder paste
<b>Application</b>	Soldering

LOCTITE MP 102 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. This product has a high tack force to resist component movement during high speed placement and long printer abandon times.

## FEATURES AND BENEFITS

- Effective over a wide range of printer cycle times and squeegee speeds
- Excellent printer open time and between print abandon time
- Long component tack time and high tack force
- 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 powder for LOCTITE MP 102 solder paste is produced by atomizing alloys conforming to the purity requirements of ANSI/J-STD-006 and EN 29453.

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
ADP	38-10 μm	-

### Solder Alloy (J-STD 006)

Henkel Code	Alloy	Melting Point, °C
Sn62	Sn62Pb36Ag2	179°C
Sn63	Sn63Pb37	183°C

## SOLDER PASTE PROPERTIES

Alloy	Sn62, Sn63
Powder Size Coding	ADP
Metal Content, %	90
Brookfield Viscosity @ 25°C, mPa.s Spindle TF, Speed 5 rpm, 2 minutes	660,000
Malcom Viscosity @ 25°C, Pa.s @ Shear Rate of 6 s <sup>-1</sup> , Speed 10 rpm	2,400
Malcom Viscosity, 30rpm, 25°C, Poise	1,175
Thixotropic Index (Ti) Ti = log (1.8/18 s <sup>-1</sup> )	0.53
Slump, IIV test method, mm <b>RT, 1 hour</b>	
0.7 x 0.7 mm pads	0.2
1.5 x 1.5mm pads	0.2
<b>80°C, 20 minutes</b>	
0.7 x 0.7 mm pads	0.2
1.5 x 1.5 mm pads	0.2
Tack:	
Initial tack force, g/mm <sup>2</sup>	1.4
Useful open time, hours	>72

## DIRECTIONS FOR USE

### Application:

LOCTITE MP 102 is designed for high volume stencil printing applications with component lead pitches down to 0.3mm due in part to the use of a unique solder powder particle size distribution. Conventional metal blade squeegees may be used with a contact angle of 60° and sweep speeds of 20 to 100 mm/s .

For Pin In Hole (PIH) application printing with metal squeegee blades with a contact angle of 45° is recommended with sweep speeds of 20 to 60 mm/s. The best printing performance will be obtained under these conditions and users are recommended to increase the squeegee speed if it is below the lower limit.

The product will also tolerate long print cycle times because the material resists drying on the stencil and blocking the 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 for 0.4 mm pitch pads at 100 mm/s squeegee speed.

The relatively low print pressure required by MP102 solder paste facilitates second side printing where supporting the board on the populated side may be difficult.

Users should be aware that paste release from stencil apertures is excellent and may be greater than products previously used on the same stencils. It produces deposits with more consistent paste volume and paste height. Stencil aperture size may previously have been optimised to deal with products that have inferior release characteristics and so the volume of paste deposited with MP102 may be slightly greater. Normally, this will be within the printing process window but it may produce a greater risk of midchip solder balling.

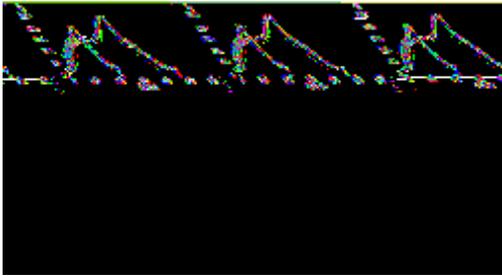
Reducing aperture openings will compensate for this effect.

#### Component Placement:

LOCTITE MP 102 paste has excellent tack properties and is capable of holding large components in place without movement during high speed placement cycles before reflow. Components may be placed several hours after printing, although this is naturally dependent on the ambient conditions. Once components are placed, the boards may be left for several hours before reflow without impact on the defect levels, depending on the previous history of the printed board.

#### Reflow:

LOCTITE MP 102 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.



As with all solder pastes, reflow of LOCTITE MP 102 paste may be carried out in nitrogen if this is installed but there is unlikely to be any significant effect on defect rates.

#### Cleaning:

The residues from LOCTITE MP 102 solder paste are intended to be left on completed assemblies without cleaning. They are designed to pass the normal industry Surface Insulation Resistance, Electromigration and Ionic Contamination tests as well as specific customer accelerated life tests. They also have very little color after reflow and this provides a pleasing appearance for finished assemblies and may be beneficial for auto inspection equipment.

Where cleaning is required, users are advised to evaluate the compatibility of solder paste, reflow profile, cleaning material and cleaning process. Good results are likely to be achieved with popular cleaning materials and effective process equipment.

If electrical testing is to be carried out, the residues of this material may be probed with minimal risk of false failures and contact tip contamination. The residues are soft but not sticky. They are non conductive and probe maintenance is an integral part of a successful electrical test process.

Misprinted boards and stencils may be cleaned with normal proprietary cleaning solvents, including LOCTITE MSC 01 solvent cleaner.

#### RELIABILITY PROPERTIES

##### Solder Paste Medium:

LOCTITE MP 102 medium contains a stable resin system and solvents with high boiling ranges. The formulation has been tested to the requirements of IPC-SF-818 and Bellcore specifications.

Corrosion	DTD 599A	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)	J-STD-004	Pass
(without cleaning)	GR-78-CORE	Pass
Electromigration (ECM)	GR-78-CORE	Pass
(without cleaning)		
Flux Activity Classification	IPC-SF-818	LR3CN
	J-STD-004	PassROL0
	EN29454	1.1.2

#### STORAGE AND SHELF LIFE

##### Storage:

If stored tightly sealed in the original container at 0 to 10°C a minimum shelf life of 183 days can be expected for LOCTITE MP 102 pastes. Cold packed air shipment is recommended to minimize the time the containers 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 102 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 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.

For further specific shelf life information, contact your local Technical Service Center.

#### 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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