

LOCTITE GC 10

March 2019

PRODUCT DESCRIPTION

LOCTITE GC 10 provides the following product characteristics:

Technology	No-clean and Halogen-free Solder Paste
Application	Pb-free soldering

LOCTITE GC 10 is a halogen free, zero halogens added, no-clean, low voiding, Pb-free solder paste specially formulated to provide added long term stability over a wide range of temperature conditions. The enhanced paste stability created through its novel formulation strategy increases both field application yields and on-line paste utilization.

LOCTITE GC 10 also shows excellent solderability when reflowed in both air and nitrogen across a wide range of challenging surface finishes and component metallizations including immersion Ag, OSP-Cu, ENIG and CuNiZn. It supports excellent reflow to overcome industry wide HiP and NWO challenges. The new flux chemistry protects the solder joint longer, improves coalescence and optimizes wetting performance, allowing for very shiny solder joints.

LOCTITE GC 10 is suitable for use with industry standard SAC alloys.

FEATURES AND BENEFITS

- Halogen-free flux: passes IC with pretreatment IPC-TM-650 EN14582
- Halogen-free flux classification: ROL0 to ANSI/J-STD-004 Rev. B
- Printing: down to 0.3 mm pitch
- Printing: up to 72 hours stencil life
- Printing: up to 24 hours abandon time
- Printing: suitable for high-speed printing up to 125 mms⁻¹
- Printing: improved paste-transfer efficiency
- Reflow: enhanced soak process window 150-200°C (temperature and time)
- Reflow: enhanced process window with superior coalescence and wetting
- Reflow: minimal hot slump at 182°C
- Reflow: superior coalescence and wetting on small components including 01005
- Reflow: very shiny solder joints
- Reflow: clear, colorless residues for easy post-reflow inspection
- Reflow: residues print testable after 4x reflows

TYPICAL PROPERTIES

Solder Powder

Solder powder is produced to a quality level that exceeds IPC industry requirements for sphericity, size distribution, impurities and oxide levels.

All solder powders are RoHS compliant.

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

Type 3 Powder

Powder Description	T3
Powder Particle Size Distribution	25 to 45 µm
Henkel Former Description	AGS

Type 4 Powder

Powder Description	T4
Powder Particle Size Distribution	20 to 38 µm
Henkel Former Description	DAP

Type 5 Powder

Powder Description	T5
Powder Particle Size Distribution	15 to 25 µm
Henkel Former Description	KBP

Solder Alloy (J-STD 006)

LOCTITE Code	SAC305
Henkel Former Description	97SC
Alloy Composition	Sn96.5 Ag3.0 Cu0.5
Melting Point (°C)	217
Ag %	3.0

Solder Paste Typical Properties

Based on T3 powder

Metal Content, %	88.5
Brookfield Viscosity @ 25°C, mPa·s (cP)	933,000
Spindle TF, speed 5 rpm, after 2 minutes	
Malcom Viscosity @ 25°C, Pa.s	207
Speed 10 rpm	
Malcom Thixotropic Index	0.52
IPC Slump A21, mm	
25°C, 15 minutes	
0.33 x 2.03 mm pads	0.10
0.63 x 2.03 mm pads	0.33
IPC Slump A21, mm	
182°C, 15 minutes	
0.33 x 2.03 mm pads	0.15
0.63 x 2.03 mm pads	0.33

Based on T4 powder

Metal Content, %	88.5
Brookfield Viscosity @ 25 °C, mPa·s (cP)	900,000
Spindle TF, speed 5 rpm, after 2 minutes	
Malcom Viscosity @ 25 °C, Pa.s	190
Speed 10 rpm	
Malcom Thixotropic Index	0.5
IPC Slump A21, mm	
25°C, 15 minutes	
0.33 x 2.03 mm pads	0.10
0.63 x 2.03 mm pads	0.33

IPC Slump A21, mm <u>182°C, 15 minutes</u>	
0.33 x 2.03 mm pads	0.20
0.63 x 2.03 mm pads	0.33

Based on T5 powder

Metal Content, %	88.5
Brookfield Viscosity @ 25°C, mPa.s Spindle TF, Speed 5 rpm, 2 minutes	883,000
Malcom Viscosity @ 25°C, Pa.s Speed 10 rpm	209
Malcom Thixotropic Index	0.48
IPC Slump A20, mm <u>25°C, 15 minutes</u>	
0.20 x 2.03 mm pads	0.075
0.33 x 2.03 mm pads	0.06
IPC Slump A20, mm <u>182°C, 15 minutes</u>	
0.20 x 2.03 mm pads	0.125
0.33 x 2.03 mm pads	0.15

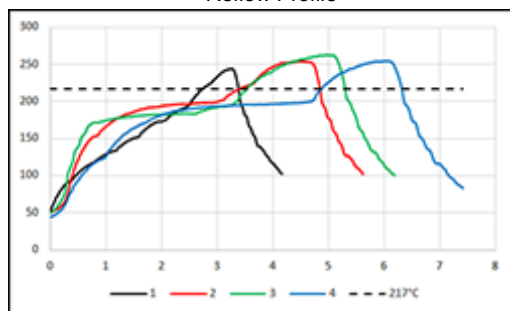
DIRECTIONS FOR USE**Printing:**

- LOCTITE GC 10 is available for stencil printing with Type 3, Type 4 and Type 5 powder.
- Printing at speeds between 25 to 125 mm/s can be achieved using laser cut, electropolished or electroformed stencils with metal squeegees.

Reflow:

- Suitable for convection, IR, hot belt and vapor phase.
- Proven profiles for multiple circuit board configurations.

Reflow Profile

**Cleaning:**

- Cleaning Solder Paste from Stencils:
 - LOCTITE GC 10 is a no-clean solder paste designed to be left on the PCB in many applications post assembly; it does not pose a hazard to long-term reliability
 - For stencil cleaning and cleaning board misprints, LOCTITE MSC 01 solvent cleaner is recommended
- Cleaning Solder Paste from Circuit Boards:
 - Residues can be removed using conventional cleaning processes based on solvents, such as LOCTITE MCF 800.
 - Cleaning of some assemblies is best conducted in an ultrasonic bath.
 - Tap water is not recommended for rinsing. Ionic impurities present in tap water can lead to reduced reliability of the assembly.

RELIABILITY PROPERTIES**Solder Paste Medium:**

LOCTITE GC 10 medium contains a stable resin system, slow evaporating solvents and with minimal odor. The formulation has been tested to the requirements of the ANSI/J-STD-004B for a type ROL0 classification specification.

Test	Specification	Results
Flux Corrosion	J-STD004B (2.6.15C)	Pass
Copper Mirror	J-STD004B (2.3.32D)	Pass
Surface Insulation Resistance (SIR)	J-STD004B (2.6.3.7)	Pass
Electromigration (ECM)	J-STD004B (2.6.14.1)	Pass
Flux Activity Classification	J-STD004B	ROL0

STORAGE AND SHELF LIFE**Storage:**

Optimal storage: 5 to 25°C (± 1.5°C)

Storage information may be indicated on the product container labelling. Material removed from containers may be contaminated during use. Do not return products to the original container. Henkel Corporation cannot assume responsibility for product that has been contaminated or stored under conditions other than those previously indicated. If additional information is required, please contact your local Technical Service Center or Customer Service Representative.

Shelf Life:

Provided that LOCTITE GC 10 is stored in the original container, a minimum shelf life of 365 days at 5 to 25°C (± 1.5°C) or 31 days at 40°C can be expected.

If stored below 20°C, allow to stabilize to at least 23°C. Do not use forced heating methods to bring the solder paste up to 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

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

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The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. The product can have a variety of different applications as well as differing application and working conditions in your environment that are beyond our control. Henkel is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product.

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Reference 0.6