

LOCTITE GC 18

February 2020

PRODUCT DESCRIPTION

LOCTITE GC 18 provides the following product characteristics:

Technology	Solder paste
Application	Low voiding, Halogen-free, Pb-free soldering

LOCTITE GC 18 is a halogen free, no-clean, low voiding, Pb-free solder paste specially formulated to provide low voiding when soldering Bottom-Terminated Components (BTC- QFN, DPAK and LGA). This material is also designed to enhance stability in printing applications.

FEATURES AND BENEFITS

- Low Voiding: < 25% voiding across small and large BTC
- IPC Class III voiding for BGA/CSP
- Excellent soldering performance
- Good resistance to graping in demanding reflow profiles
- Excellent humidity resistance
- Minimal slump at room temperature and up to 190°C
- Process capability: (Cpk) >2.0 for area ratios down to 0.50
- Stable on-stencil viscosity for improved printing consistency
- Reliability: Pass SIR and ECM independent of reflow profile
- Pin-testable post-reflow residues after four reflow cycles
- Compatibility with approved encapsulant technologies
- Stable at room temperature for enhanced sustainability

Refer to the Engineering Manual for LOCTITE GC 18 solder paste for additional technical information.

TYPICAL PROPERTIES

LOCTITE GC 18 solder alloys and powders are RoHS and EICC compliant.

Solder Alloy (J-STD 006)

LOCTITE Code	SAC305
Melting Point (°C)	217
Nominal Composition (% by weight)	
	Sn 96.5
	Ag 3.0
	Cu 0.5

Solder Powder

Careful control of the atomization process for production of solder powders for LOCTITE GC 18 solder paste ensures that

the solder powder is produced to a quality level that exceeds IPC/J-STD and EN 29453 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.

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

Type 3 Powder

Powder Description	T3
Powder Particle Size Distribution	25-45 µm

Type 4 Powder

Powder Description	T4
Powder Particle Size Distribution	20-38 µm

Solder Paste Typical Properties

Based on T3 powder

Metal Content, %	88.5
Malcom Viscosity @ 25°C, Pa.s Speed 10 rpm	230
Thixotropic Index	0.51
IPC Slump A21, mm <i>182°C, 10 minutes (0.2 mm stencil)</i> 0.63 x 2.03 mm pads	0.33
0.33 x 2.03 mm pads	0.20
IPC Slump A20 <i>182°C, 10 minutes (0.1 mm stencil)</i> 0.33 x 2.03 mm pads	0.25
0.20 x 2.03 mm pads	0.125
Solder balling (IPC 2.4.43) after humid storage	Preferred

Based on T4 powder

Metal Content, %	88.5
Malcom Viscosity @ 25 °C, Pa.s Speed 10 rpm	250
Thixotropic Index	0.50
IPC Slump A21, mm <i>182°C, 10 minutes (0.2 mm stencil)</i> 0.63 x 2.03 mm pads	0.33
0.33 x 2.03 mm pads	0.20
IPC Slump A20 <i>182°C, 10 minutes (0.1 mm stencil)</i> 0.33 x 2.03 mm pads	0.25
0.20 x 2.03 mm pads	0.125
Solder balling (IPC 2.4.43) after humid storage	Preferred

DIRECTIONS FOR USE**Printing:**

Optimum printing results can be achieved using typical fabricated stencils and metal squeegees according to the guidelines mentioned in the Engineering Manual.

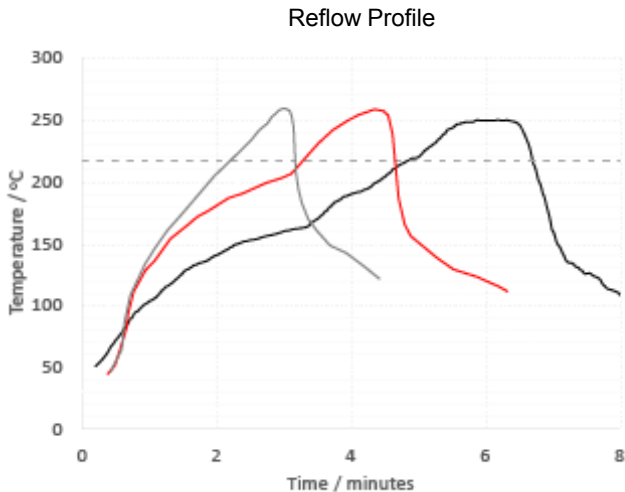
Acceptable print quality has been achieved after printer pause times of 60 minutes and above without requiring a recovery print (knead).

Reflow:

Excellent soldering performance is typically achieved using a convection reflow oven in air. Nitrogen atmosphere reflow can be used if desired.

LOCTITE GC 18 solder pastes may be reflowed using a wide range of profile types. For optimum soldering and voiding performance a peak temperature of 245 to 260°C with a time above liquidus (217°C) between 50 to 110 seconds is recommended. Three example profiles are shown which have demonstrated low voiding in a representative assembly process.

Further reflow profiles can be reviewed in the Engineering Manual.

**Cleaning:**

LOCTITE GC 18 is a no-clean solder paste designed to be left on the PCB, post assembly, without compromising long-term reliability.

Should there be a specific requirement for residue removal, this may be achieved using conventional electronic cleaning processes based on commercially available cleaning materials designed for the de-fluxing of electronic assemblies.

RELIABILITY PROPERTIES**Flux Properties:**

The flux used in LOCTITE GC 18 solder paste contains a stable resin system, slow evaporating solvents and has minimal odor. The flux has been tested to the requirements of the J-STD-004 B standard, attaining ROL0 classification .

J-STD-004B (IPC TM-650 Test Method)	Results
Copper Mirror (2.3.32D)	Pass
Surface Insulation Resistance (SIR) (2.6.3.7)	Pass
Flux Corrosion (2.6.15C)	Pass
Electromigration (ECM) (2.6.14.1)	Pass
Halogen Content (Pretreatment EN14582, 2.3.28.1)	Pass
Flux Activity Classification	Pass

COMPATIBILITY:

LOCTITE GC 18 flux residues have been shown to be compatible with encapsulation technologies.

LOCTITE GC 18 solder paste is compatible with LOCTITE GC 50 jetting and dispensing solder paste.

STORAGE AND SHELF LIFE

Containers: LOCTITE GC 18 is supplied in:

- 500g jars
- 600g Semco cartridges
- Customized packaging may be available upon request.

Storage:

Optimal storage: 5 to 25°C (41 to 77°F)

Please refer to the LOCTITE GC 18 Handling Guideline for further information on storage conditions.

Shelf Life:

Provided that LOCTITE GC 18 is stored in the original container, shelf life of 180 days at 5 to 25°C (41 to 77°F) can be expected.

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:**

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. Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

In case products are delivered by Henkel Belgium NV, Henkel Electronic Materials NV, Henkel Nederland BV, Henkel Technologies France SAS and Henkel France SA please additionally note the following:

In case Henkel would be nevertheless held liable, on whatever legal ground, Henkel's liability will in no event exceed the amount of the concerned delivery.

In case products are delivered by Henkel Colombiana, S.A.S. the following disclaimer is applicable:

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. 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.

Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

In case products are delivered by Henkel Corporation, Resin Technology Group, Inc., or Henkel Canada Corporation, the following disclaimer is applicable:

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.

Trademark usage

Except as otherwise noted, all trademarks in this document are trademarks of Henkel Corporation in the U.S. and elsewhere. ® denotes a trademark registered in the U.S. Patent and Trademark Office.

Reference 1

Americas

+1.888.943.6535

Europe

+32.1457.5611

Asia

+86.21.2891.8000

For the most direct access to local sales and technical support visit: www.henkel.com/electronics