

# LOCTITE GC 3W

January 2016

## PRODUCT DESCRIPTION

LOCTITE GC 3W provides the following product characteristics:

<b>Technology</b>	Solder paste
<b>Application</b>	Pb-free soldering, Halogen-free, Water Washable flux

LOCTITE GC 3W is a halogen free, water-washable, Pb-free solder paste specially formulated to provide excellent humidity resistance. LOCTITE GC 3W shows excellent solderability when reflowed in both air and nitrogen across a wide range of challenging surface finishes including OSP-Cu, ENIG and Silver.

## FEATURES AND BENEFITS

- Water washable, Pb-free solder paste
- Halogen-free flux: passes IC with pretreatment IPC-TM-650 2.3.34/EN14582
- Halogen-free flux classification: ORM0 to ANSI/J-STD-004 Rev.
- Formulated so residues can be cleaned with deionized water
- Humidity resistance: excellent coalescence after 24 hours exposure to 27°C/80% RH
- Excellent resistance to solder balling, initially and after exposure to humidity
- Suitable for fine pitch, high speed printing up to 150 mms<sup>-1</sup> (6"/s)
- Excellent paste transfer efficiency after extended abandon times
- Excellent paste transfer efficiency after extended printing time
- Humidity Resistance: Enhanced tack time
- Suitable for single and double side reflow

## TYPICAL PROPERTIES

### Solder Powder

Careful control of the atomisation process for production of solder powders for LOCTITE GC 3W solder pastes ensures that the solder powder is produced to a quality level that exceeds J-STD-006, 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.

All solder powders are RoHS compliant.

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

#### Type 3 Powder

<b>Powder Description</b>	T3
<b>Powder Particle Size Distribution</b>	25 to 45 µm
<b>Henkel Former Description</b>	AGS

#### Type 4 Powder

<b>Powder Description</b>	T4
<b>Powder Particle Size Distribution</b>	20 to 38 µm
<b>Henkel Former Description</b>	DAP

### Solder Alloy (J-STD 006)

<b>LOCTITE Code</b>	SAC305
<b>Henkel Former Description</b>	97SC
<b>Melting Point (°C)</b>	217

### Solder Paste Typical Properties

#### Based on Type 3 powder

Metal Content, %	89.5
Brookfield Viscosity @ 25°C, mPa.s Spindle TF, Speed 5 rpm, after 2 minutes	595,000
Malcom Viscosity @ 25 °C, Pa.s Speed 10 rpm	150
Thixotropic Index (Ti) Ti = log (1.8/18 s <sup>-1</sup> )	0.45
Useful stencil life, hours	>24
IPC Slump, mm <u>25°C, 15 minutes</u>	
0.33 x 2.0 mm pads	0.2
0.63 x 2.0 mm pads	0.33
IPC Slump, mm <u>182°C, 15 minutes</u>	
0.33 x 2.0 mm pads	0.2
0.63 x 2.0 mm pads	0.33

#### Based on Type 4 powder

Metal Content, %	89.5
Brookfield Viscosity @ 25 °C, Pa.s Spindle TF, speed 5 rpm, after 2 minutes	784,000
Malcom Viscosity @ 25 °C, Pa.s Speed 10 rpm	180
Thixotropic Index (Ti) Ti = log (1.8/18 s <sup>-1</sup> )	0.48
Useful stencil life, hours	>24
IPC Slump, mm <u>25°C, 15 minutes</u>	
0.33 x 2.0 mm pads	0.2
0.63 x 2.0 mm pads	0.33
IPC Slump, mm <u>182°C, 15 minutes</u>	
0.33 x 2.03 mm pads	0.2
0.63 x 2.03 mm pads	0.33

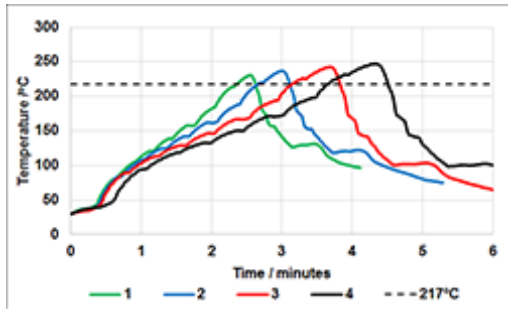
## DIRECTIONS FOR USE

### Printing:

- Printing at speeds up to 150 mm.s<sup>-1</sup> (6"/s) can be achieved using typical stencils and metal squeegees.
- Sufficient pressure should be applied to achieve a clean wipe of the stencil topside surface.
- Under laboratory conditions acceptable print quality on 0.5 mm ball devices and 0.4 mm QFP patterns has been achieved after printer down times of 4 hours without requiring a knead cycle.

**Reflow:**

- Reflow has been assessed using a typical convection reflow oven.
- Optimal aerobic reflow can be achieved by ramping to a peak temperature of 225 to 250°C at 0.8 to 1.5°C/second and with a soak above the reflow temperature (217°C) for 20 to 50 seconds.
- Example profiles that have shown good performance- for reflow and subsequent cleaning- are presented below. Reflow soldering can also be carried out in a nitrogen atmosphere.

**Cleaning:**

- The post-soldering residues of LOCTITE GC 3W solder paste must be removed by cleaning.
- Cleaning can be performed using spray in air/ spray under immersion or ultrasonic cleaning methods.
- The post-soldering residues are designed to be removed from assemblies in an aqueous cleaner without the use of rinse aids and/or saponifiers, typically using water at 40 to 60°C with deionized water for the final rinse.

**RELIABILITY PROPERTIES****Flux Properties:**

LOCTITE GC 3W contains a stable water-washable resin system and slow evaporating solvents

Test	Specification	Results
Flux Corrosion	J-STD004B (2.6.15C)	Pass
Copper Mirror	J-STD004B (2.3.32D)	Pass (cleaned)
Surface Insulation Resistance (SIR)	J-STD004B (2.6.3.7)	Pass (cleaned)
	J-STD004B (2.6.3.3)	Pass (cleaned)
Electromigration (ECM)	J-STD004B (2.6.14.1)	Pass
Flux Activity Classification	J-STD004B	ORM0

**PACKAGING**

LOCTITE GC 3W is available in 500 gram jars and 600 grams Semco cartridge .

**Storage:**

**Optimal storage:** 0 to 25°C ± 1.5°C (32 to 77°F ± 1.5°F)

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 LOCTITE GC 3W is stored tightly sealed in the original container at 0 to 25°C ± 1.5°C (32 to 77°F ± 1.5°F), a minimum shelf life of 180 days 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 0.2