LOCTITE GC 10 provides the following product characteristics:

<table>
<thead>
<tr>
<th>Technology</th>
<th>No-clean and Halogen-free Solder Paste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>Pb-free soldering</td>
</tr>
</tbody>
</table>

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
- 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.

- **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
- **Malcom Viscosity @ 25°C, Pa.s Speed 10 rpm**: 207
- **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
- **Malcom Viscosity @ 25°C, Pa.s Speed 10 rpm**: 190
- **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
Based on TS powder

<table>
<thead>
<tr>
<th>IPC Slump A21, mm</th>
<th>182°C, 15 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.33 x 2.03 mm pads</td>
<td>0.20</td>
</tr>
<tr>
<td>0.63 x 2.03 mm pads</td>
<td>0.33</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IPC Slump A20, mm</th>
<th>25°C, 15 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.20 x 2.03 mm pads</td>
<td>0.075</td>
</tr>
<tr>
<td>0.33 x 2.03 mm pads</td>
<td>0.06</td>
</tr>
</tbody>
</table>

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 mms⁻¹ 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.

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.

<table>
<thead>
<tr>
<th>Test</th>
<th>Specification</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flux Corrosion</td>
<td>J-STD004B (2.6.15C)</td>
<td>Pass</td>
</tr>
<tr>
<td>Copper Mirror</td>
<td>J-STD004B (2.3.32D)</td>
<td>Pass</td>
</tr>
<tr>
<td>Surface Insulation</td>
<td>J-STD004B (2.6.3.7)</td>
<td>Pass</td>
</tr>
<tr>
<td>Resistance (SIR)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electromigration (ECM)</td>
<td>J-STD004B (2.6.14.1)</td>
<td>Pass</td>
</tr>
<tr>
<td>Flux Activity Classification</td>
<td>J-STD004B</td>
<td>ROL0</td>
</tr>
</tbody>
</table>

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

- (°C x 1.8) + 32 = °F
- kV/mm x 25.4 = V/mil
- mm / 25.4 = inches
- µm / 25.4 = mil
- N x 0.225 = lb
- N/mm x 5.71 = lb/in
- N/mm² x 145 = psi
- MPa x 145 = psi
- N·m x 8.851 = lb·in
- N·m x 0.738 = lb·ft
- N·m x 0.142 = oz·in
- mPa·s = 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 and/or registered trademarks of Henkel and its affiliates in the U.S. and elsewhere.

Reference 0.6