

# LOCTITE<sup>®</sup> SI 5055<sup>™</sup>

Known as LOCTITE<sup>®</sup> 5055<sup>™</sup>  
September 2014

## PRODUCT DESCRIPTION

LOCTITE<sup>®</sup> SI 5055<sup>™</sup> provides the following product characteristics:

|                             |                                                                                                                      |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------|
| <b>Technology</b>           | Silicone                                                                                                             |
| <b>Chemical Type</b>        | Alkoxy silicone                                                                                                      |
| <b>Appearance (uncured)</b> | Light yellow, transparent liquid <sup>LMS</sup>                                                                      |
| <b>Components</b>           | One component - requires no mixing                                                                                   |
| <b>Cure</b>                 | Ultraviolet (UV)/ visible light                                                                                      |
| <b>Application</b>          | <ul style="list-style-type: none"> <li>• Bonding</li> <li>• Potting</li> <li>• Coating</li> <li>• Sealing</li> </ul> |

LOCTITE<sup>®</sup> SI 5055<sup>™</sup> is a one-component, (UV) visible light curable silicone adhesive specifically designed for use in assembly of disposable medical devices. It is a low viscosity high performance silicone adhesive that upon exposure to light, cures into a tough transparent silicone rubber.

## ISO-10993

An ISO 10993 Test Protocol is an integral part of the Quality Program for LOCTITE<sup>®</sup> SI 5055<sup>™</sup>. LOCTITE<sup>®</sup> SI 5055<sup>™</sup> has been qualified to Henkel's ISO 10993 Protocol as a means to assist in the selection of products for use in the medical device industry. Certificates of Compliance are available on Henkel's website or through the Henkel Quality Department.

## TYPICAL PROPERTIES OF UNCURED MATERIAL

|                                                 |                           |
|-------------------------------------------------|---------------------------|
| Specific Gravity @ °C                           | 0.98                      |
| Viscosity, Brookfield - RVT, 25 °C, mPa·s (cP): |                           |
| Spindle 2, speed 20 rpm                         | 200 to 850 <sup>LMS</sup> |
| Flash Point - See SDS                           |                           |

## TYPICAL CURING PERFORMANCE

Normal processing conditions will include exposure to sufficient UV light irradiance to effectively cure the material. Surface cure can be enhanced with higher amounts of 254 nm light

## Tack Free Time

Tack Free Time is the time required to achieve a tack free surface

Tack Free Time, seconds:

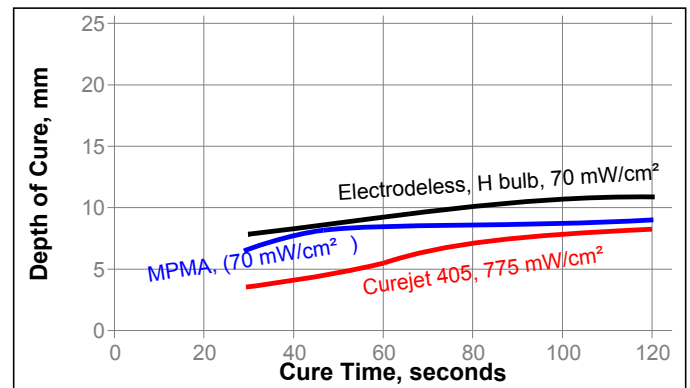
|                                           |                    |
|-------------------------------------------|--------------------|
| Zeta <sup>®</sup> 7200:                   |                    |
| 70 mW/cm <sup>2</sup> , measured @ 365 nm | ≤30 <sup>LMS</sup> |
| Zeta <sup>®</sup> 7215:                   |                    |
| 70 mW/cm <sup>2</sup> , measured @ 365 nm | 30                 |
| Electrodeless, D bulb:                    |                    |
| 70 mW/cm <sup>2</sup> , measured @ 365 nm | 120                |
| Electrodeless, H bulb:                    |                    |
| 70 mW/cm <sup>2</sup> , measured @ 365 nm | 30                 |

## Depth of Cure

|                                             |                   |
|---------------------------------------------|-------------------|
| Depth of cure (cure time 60 seconds), mm:   |                   |
| 70 mW/cm <sup>2</sup> , measured @ 365 nm,  | ≥4 <sup>LMS</sup> |
| using a Zeta <sup>®</sup> 7200 light source |                   |

## Depth of Cure (light)

Rapid depth of cure can be attained with focused UV and/or visible light. The following graph shows the cure response of some typical light sources as a function of time.



## TYPICAL PROPERTIES OF CURED MATERIAL

Cured @ 70 mW/cm<sup>2</sup>, measured @ 365 nm for 60 seconds

### Physical Properties:

|                                      |                                       |
|--------------------------------------|---------------------------------------|
| Shore Hardness, ISO 868, Durometer A | 45 to 65 <sup>LMS</sup>               |
| Elongation, at break, ISO 527-3, %   | >80 <sup>LMS</sup>                    |
| Tensile Strength, ISO 527-3          | N/mm <sup>2</sup> >6.0 <sup>LMS</sup> |
|                                      | (psi) (>870)                          |

Cured @ 70 mW/cm<sup>2</sup>, measured @ 365 nm for 60 seconds per side, using a medium pressure mercury arc light source, followed by 24 hours @ 22 °C, / 50±5% RH

**Physical Properties:**

|                                       |                                        |
|---------------------------------------|----------------------------------------|
| Shore Hardness, ISO 868, Durometer A  | 57                                     |
| Elongation, at break, ISO 527-3, %    | 161                                    |
| Tensile Strength, at break, ISO 527-3 | N/mm <sup>2</sup> 9.3<br>(psi) (1,350) |

Compression Set, ASTM D 395, Method B, %:

|                            |      |
|----------------------------|------|
| Aged @ 22 °C for 24 hours  | 7.9  |
| Aged @ 70 °C for 24 hours  | 41.7 |
| Aged @ 121 °C for 24 hours | 92   |
| Aged @ 150 °C for 24 hours | 92.5 |

Gas Permeability, ASTM D1434, cm<sup>2</sup> /sec/atm:

|                |                        |
|----------------|------------------------|
| Helium         | 3.88×10 <sup>-06</sup> |
| Carbon Dioxide | 1.40×10 <sup>-05</sup> |
| Oxygen         | 2.11×10 <sup>-06</sup> |

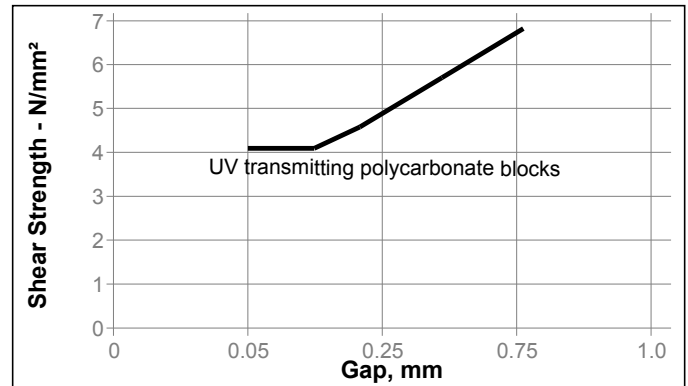
**Electrical Properties:**

|                                                      |                       |
|------------------------------------------------------|-----------------------|
| Dielectric Breakdown Strength, IEC 60243-1, kV/mm    | 15.3                  |
| Dielectric Constant / Dissipation Factor, IEC 60250: |                       |
| 1 kHz                                                | 2.8 / 0.03            |
| 10 MHz KHz                                           | 2.8 / 0.004           |
| 100 KHz                                              | 2.8 / 0.006           |
| 1 MHz                                                | 2.7 / 0.006           |
| 10 MHz                                               | 2.8 / 0.01            |
| Volume Resistivity, IEC 60093, Ω·cm                  | 1.10×10 <sup>15</sup> |

|                |                                      |
|----------------|--------------------------------------|
| Glass to ABS   | N/mm <sup>2</sup> 2.3<br>(psi) (340) |
| Glass to Nylon | N/mm <sup>2</sup> 1.3<br>(psi) (190) |

**Shear Strength vs. Gap Thickness**

Cured @ 70 mW/cm<sup>2</sup>, measured @ 365 nm for 60 seconds using a medium pressure mercury arc light source plus 24 hours @ 22 °C, / 50±5% RH

**TYPICAL PERFORMANCE OF CURED MATERIAL****Adhesive Properties**

Cured @ 70 mW/cm<sup>2</sup>, measured @ 365 nm for 60 seconds per side, using a Loctite® ZETA® 7215™ UV Chamber (MPMA), plus 24 hours @ 22 °C, / 50±5% RH

Lap Shear Strength, ISO 4587:

|                                                                    |                                      |
|--------------------------------------------------------------------|--------------------------------------|
| Aluminum to Glass                                                  | N/mm <sup>2</sup> 2.4<br>(psi) (355) |
| Steel to Glass                                                     | N/mm <sup>2</sup> 2.7<br>(psi) (400) |
| Polycarbonate (UV Transmitting) to Polycarbonate (UV Transmitting) | N/mm <sup>2</sup> 4<br>(psi) (590)   |
| Polycarbonate (UV Transmitting) to Glass                           | N/mm <sup>2</sup> 2<br>(psi) (290)   |
| Polycarbonate (UV Transmitting) to Aluminum                        | N/mm <sup>2</sup> 4.5<br>(psi) (650) |
| Polycarbonate (UV Transmitting) to Steel                           | N/mm <sup>2</sup> 2.6<br>(psi) (380) |
| Polycarbonate (UV Transmitting) to PVC                             | N/mm <sup>2</sup> 3.2<br>(psi) (460) |
| Polycarbonate (UV Transmitting) to PBT                             | N/mm <sup>2</sup> 3.6<br>(psi) (520) |
| Polycarbonate (UV Transmitting) to ABS                             | N/mm <sup>2</sup> 3.7<br>(psi) (540) |
| Polycarbonate (UV Transmitting) to Nylon                           | N/mm <sup>2</sup> 4<br>(psi) (580)   |
| Glass to PVC                                                       | N/mm <sup>2</sup> 2.3<br>(psi) (330) |
| Glass to PBT                                                       | N/mm <sup>2</sup> 1.9<br>(psi) (270) |

**TYPICAL ENVIRONMENTAL RESISTANCE**

Cured @ 70 mW/cm<sup>2</sup>, measured @ 365 nm, for 60 seconds per side, using a Loctite® ZETA® 7215™ UV Chamber (MPMA), followed by 24 hours @ 22 °C, / 50±5% RH

**Heat Aging**

Aged at temperature indicated and tested @ 22 °C

Aged @ 177 °C for 168 hours:

|                                            |      |
|--------------------------------------------|------|
| Change in Durometer, Points (Initial = 57) | -22  |
| Change in Tensile Strength, %              | -64  |
| Change in Elongation, %                    | -24  |
| Weight Loss, %                             | 21.7 |

**Typical Fluid Immersion Properties**

Aged @ 100 °C for 168 hours:

glycol/water, 50:50:

|                                            |      |
|--------------------------------------------|------|
| Change in Durometer, Points (Initial = 57) | -10  |
| Change in Tensile Strength, %              | -14  |
| Change in Elongation, %                    | -9   |
| Volume Swell, %                            | -0.3 |

5W30 oil:

|                                            |     |
|--------------------------------------------|-----|
| Change in Durometer, Points (Initial = 57) | -17 |
| Change in Tensile Strength, %              | -76 |
| Change in Elongation, %                    | 27  |

ATF:

|                                            |     |
|--------------------------------------------|-----|
| Change in Durometer, Points (Initial = 57) | -39 |
| Change in Tensile Strength, %              | -87 |
| Change in Elongation, %                    | 34  |

**Aged @ 150 °C for 168 hours:**

|                                            |     |
|--------------------------------------------|-----|
| glycol/water, 50:50:                       |     |
| Change in Durometer, Points (Initial = 57) | -23 |
| Change in Tensile Strength, %              | -57 |
| Change in Elongation, %                    | -31 |

**5W30 oil:**

|                                            |     |
|--------------------------------------------|-----|
| Change in Durometer, Points (Initial = 57) | -38 |
| Change in Tensile Strength, %              | -92 |
| Change in Elongation, %                    | 21  |
| Volume Swell, %                            | 78  |

**ATF:**

|                                            |     |
|--------------------------------------------|-----|
| Change in Durometer, Points (Initial = 57) | -57 |
| Change in Tensile Strength, %              | -97 |
| Change in Elongation, %                    | 16  |
| Volume Swell, %                            | 108 |

**Sterilization Resistance**

Cured @ 70 mW/cm<sup>2</sup>, measured @ 365 nm for 30 seconds per side, using a medium pressure mercury arc light source plus 24 hours @ 22 °C, / 50±5% RH

% of initial strength:

|                                 | <b>Gamma</b><br>30kGy | <b>ETO</b><br>1 Cycle | <b>Autoclave</b><br>1 Cycle |
|---------------------------------|-----------------------|-----------------------|-----------------------------|
| Polycarbonate (UV Transmitting) | 100                   | 100                   | 100                         |

**GENERAL INFORMATION**

**This product is not recommended for use in pure oxygen and/or oxygen rich systems and should not be selected as a sealant for chlorine or other strong oxidizing materials.**

**For safe handling information on this product, consult the Safety Data Sheet (SDS).**

**Directions for use:**

1. For best performance bond surfaces should be clean and free from grease.
2. The product is designed to be initially cured by UV/visible light at a minimum irradiance of 70 mW/cm<sup>2</sup> for approximately 60 seconds, increased exposure may be required for curing deeper sections.
3. Functional strength is achieved almost instantly.
4. Full performance properties will develop over 72 hours.
5. Excess material can be easily wiped away with non-polar solvents.

**Loctite Material Specification<sup>LMS</sup>**

LMS dated January 28, 2010. Test reports for each batch are available for the indicated properties. LMS test reports include selected QC test parameters considered appropriate to specifications for customer use. Additionally, comprehensive controls are in place to assure product quality and consistency. Special customer specification requirements may be coordinated through Henkel Quality.

**Storage**

Store product in the unopened container in a dry location. Storage information may be indicated on the product container labeling.

**Optimal Storage: 8 °C to 21 °C. Storage below 8 °C or greater than 28 °C can adversely affect product properties.**

Material removed from containers may be contaminated during use. Do not return product to the original container. Henkel Corporation cannot assume responsibility for product which 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.

**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/mm<sup>2</sup> x 145 = psi  
 MPa x 145 = psi  
 N·m x 8.851 = lb·in  
 N·m x 0.738 = lb·ft  
 N·mm x 0.142 = oz·in  
 mPa·s = cP

**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 0.3