

LOCTITE[®] SI 5970[™]

Known as LOCTITE[®] 5970[™]
April 2020

PRODUCT DESCRIPTION

LOCTITE[®] SI 5970[™] provides the following product characteristics:

Technology	Silicone
Chemical Type	Alkoxy silicone
Appearance (uncured)	Black paste ^{LMS}
Components	One component - requires no mixing
Thixotropic	Reduced migration of liquid product after application to substrate
Cure	Room temperature vulcanizing (RTV)
Application	Gasketing
Specific Benefits	Excellent resistance to automotive engine oils

LOCTITE[®] SI 5970[™] has been designed specifically for gasketing applications. It withstands on line, low pressure tests carried out before product begins to cure. Typical applications include stamped sheet metal covers (timing covers and oil sumps) where good oil resistance and the ability to withstand high joint-movement is required.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.38 to 1.44 ^{LMS}
Flash Point - See SDS	
Extrusion Rate, g/min:	
Pressure 0.62 MPa, time 15seconds, temperature 25 °C:	
Semco Cartridge	40 to 80 ^{LMS}

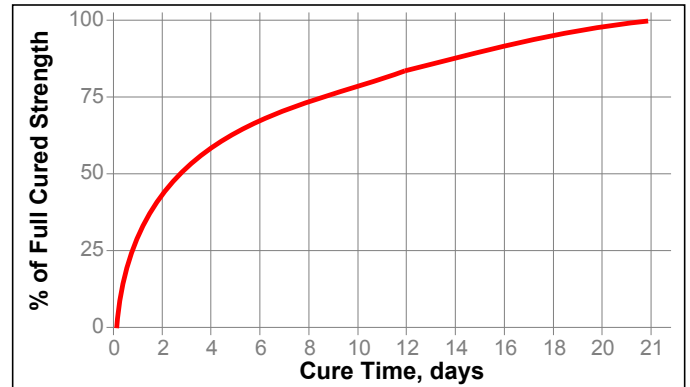
TYPICAL CURING PERFORMANCE

Surface Cure

LOCTITE[®] SI 5970[™] becomes tack free on exposure to atmospheric moisture within 25 minutes at 23±2°C / 50±5%RH.

Cure Speed

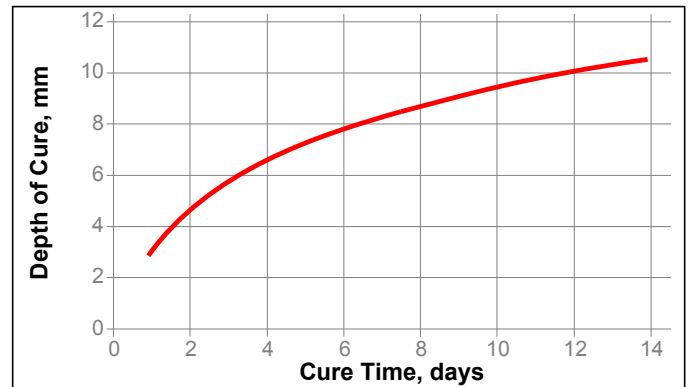
The graph below shows shear strength developed with time on Aluminum lapshears at a bond gap of 0.5 mm. Cure condition 23±2 °C, 60±5% RH. Strength is determined according to ISO 4587.



Depth of Cure

The depth of cure depends on temperature and humidity. Depth of cure was measured on strip pulled from a ramped PTFE mold (maximum depth 10 mm).

The graph below shows the increase in depth of cure with time at 23±2 °C / 50±5 % RH.



TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties:

Shore Hardness, ISO 868, Durometer A	44
Elongation, ISO 37, %	≥200 ^{LMS}
Tensile Strength, ISO 37	N/mm ² ≥1.5 ^{LMS} (psi) (≥278)

Electrical Properties:

Surface Resistivity, IEC 60093, Ω	1.4×10 ¹⁶
-----------------------------------	----------------------

Volume Resistivity, IEC 60093, Ω·cm	1.8×10 ¹⁵
Dielectric Constant / Dissipation Factor, IEC 60250:	
1 kHz	3.44 / 3.25×10 ⁻³
100 kHz	3.41 / 2.63×10 ⁻³
1 MHz	3.4 / 2.51×10 ⁻³
10 MHz	3.45 / 3.97×10 ⁻³

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 21days @ 23 °C / 50±5 % RH and 0.5 mm gap

Tensile Lap Shear Strength, :

Mild steel	N/mm ²	1.3 to 2.0
	(psi)	(190 to 290)
Aluminum 2024-T3	N/mm ²	0.7 to 1.3
	(psi)	(100 to 190)
Alclad	N/mm ²	1.0 to 1.8
	(psi)	(145 to 260)
Zinc dichromate	N/mm ²	1.5 to 2.0
	(psi)	(220 to 290)
Thermoset plastic(Novalac resin based)	N/mm ²	0.8 to 1.5
	(psi)	(120 to 220)
Nylon 66 (30% Glass filled)	N/mm ²	0.1 to 0.2
	(psi)	(15 to 30)
Polyphenylene sulphide	N/mm ²	0.8 to 1.1
	(psi)	(120 to 160)

TYPICAL ENVIRONMENTAL RESISTANCE

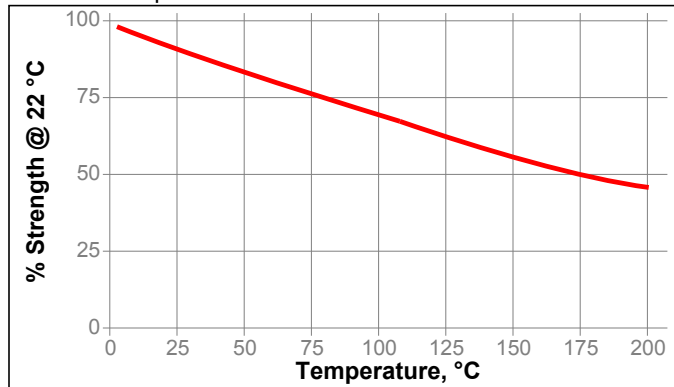
Cured for 21days @ 23±2 °C / 50±5% RH and 0.5 mm gap

Tensile Lap Shear Strength, :

Alclad

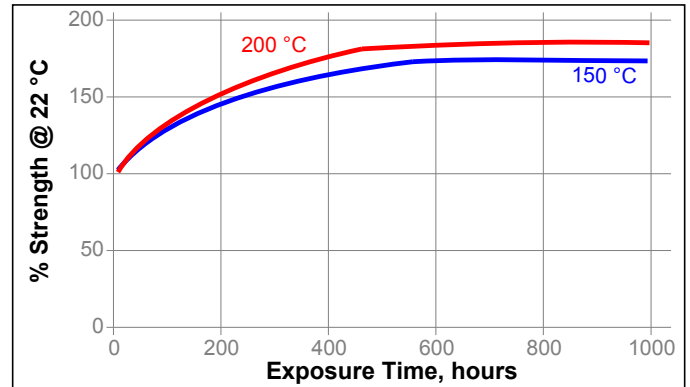
Hot Strength

Tested at temperature



Heat Aging

Aged at temperature indicated and tested @ 22 °C



Environmental Aging - Effect on bulk properties

Cured for 21days @ 23±2 °C / 50±5% RH, tested @ 22 °C, 2 mm thick film

Tensile strength, ISO 37, N/mm² (Elongation, at break, %):

Environment	100 h	500 h	1000 h
22 °C	2.0(225)	2.0(230)	2.0(225)
5W30 oil, 150 °C	1.5(140)	1.9(170)	1.9(180)
Water/glycol 50/50, 120°C	1.4(180)	1.9(55)	1.3(55)
Water/OAT 50/50, 105 °C	0.7(120)	0.9(40)	1.1(40)

Environmental Aging

Alclad

Environment	°C	% of initial strength		
		100 h	500 h	1000 h
Air	150	130	170	170
Motor oil (5W30)	150	70	70	70
Water/glycol 50/50	120	60	70	70
Water/OAT 50/50	105	55	60	75

Zinc dichromate

Environment	°C	% of initial strength		
		100 h	500 h	1000 h
Motor oil (5W30)	150	55	55	55
Water/glycol 50/50	120	45	45	45
Water/OAT 50/50	105	50	50	70

Novalac Thermoset

Environment	°C	% of initial strength		
		100 h	500 h	1000 h
Motor oil (5W30)	150	35	45	55
Water/glycol 50/50	120	50	50	60

Polyphenylene sulphide

Environment	°C	% of initial strength		
		100 h	500 h	1000 h
Motor oil (5W30)	150	---	100	---
Water/glycol 50/50	120	---	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. Moisture curing begins immediately after the product is exposed to the atmosphere, therefore parts to be assembled should be mated within a few minutes after the product is dispensed.
3. The bond should be allowed to cure (e.g. seven days), before subjecting to heavy service loads.
4. Excess material can be easily wiped away with non-polar solvents.
5. For full automatic applications a volumetric dispensing system is recommended.

Loctite Material Specification^{LMS}

LMS dated May 15, 2001. 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. Storage conditions are for long term product storage. Transit and interim storage situations (i.e. receiving) are not encompassed by Henkel's storage requirements. It should be noted however that all efforts should be made to store material as required, as soon as possible. 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

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

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.

