

## LOCTITE® 5205™

August 2005

### PRODUCT DESCRIPTION

LOCTITE® 5205™ provides the following product characteristics:

<b>Technology</b>	Acrylic
<b>Chemical Type</b>	Dimethacrylate ester
<b>Appearance (uncured)</b>	Viscous red liquid <sup>LMS</sup>
<b>Fluorescence</b>	Positive under UV light <sup>LMS</sup>
<b>Components</b>	One component - requires no mixing
<b>Viscosity</b>	High
<b>Cure</b>	Anaerobic
<b>Application</b>	Sealing
<b>Strength</b>	Medium
<b>Specific Benefit</b>	Maintains flexibility after exposure to high temperature

LOCTITE® 5205™ cures when confined in the absence of air between close fitting metal surfaces. It seals close fitting joints between rigid metal faces and flanges. Provides resistance to low pressures immediately after assembly of flanges. This product may be dispensed robotically with the appropriate LOCTITE® product conditioning and dispensing systems. Typically used as a form-in-place gasket on rigid flanged connections, e.g. gearbox and engine casings, etc.

### TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.19
Flash Point - See SDS	
Viscosity, Brookfield - RVT, 25 °C, mPa·s (cP):	
Spindle 7., speed 2.5 rpm, Helipath	200,000 to 490,000
Spindle 7., speed 20 rpm, Helipath	60,000 to 160,000
Viscosity @ 25°C, mPa·s (cP):	
Haake cone & plate:	
Haake PK 100, 2 °C @ 20 s <sup>-1</sup>	30,000 to 75,000 <sup>LMS</sup>

### Instant Sealing Capability

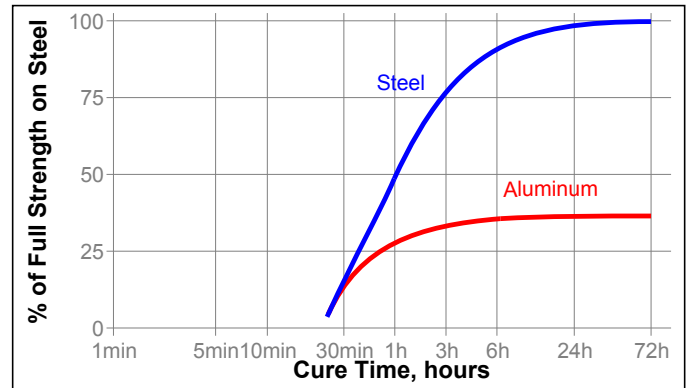
Anaerobic sealants have the ability to resist low on-line test pressures while uncured. This test was performed with uncured product immediately after assembly of a glass plate and an annular zinc dichromate flange before cure occurred. The pressure was maintained for 1 minute.

Pressure Resistance, MPa:	
Induced Gap 0.05 mm	0.05
Induced Gap 0.125 mm	0.03

### TYPICAL CURING PERFORMANCE

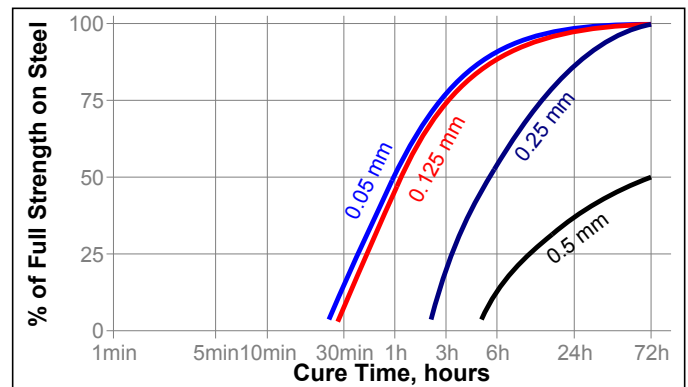
#### Cure Speed vs. Substrate

The rate of cure will depend on the substrate used. The graph below shows the shear strength developed with time on grit blasted steel lap shears compared to different materials and tested according to ISO 4587.



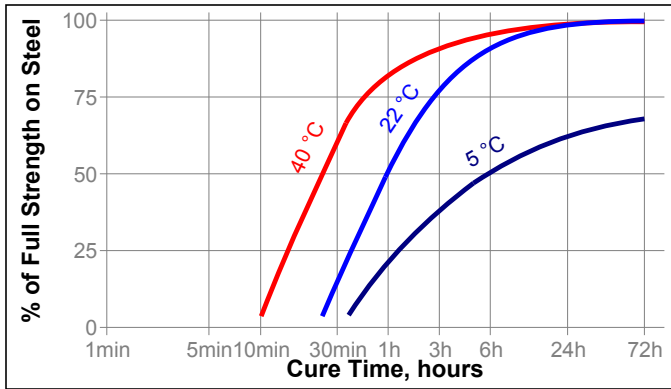
#### Cure Speed vs. Bond Gap

The rate of cure will depend on the bondline gap. The following graph shows the shear strength developed with time on grit blasted steel lap shears at different controlled gaps and tested according to ISO 4587.



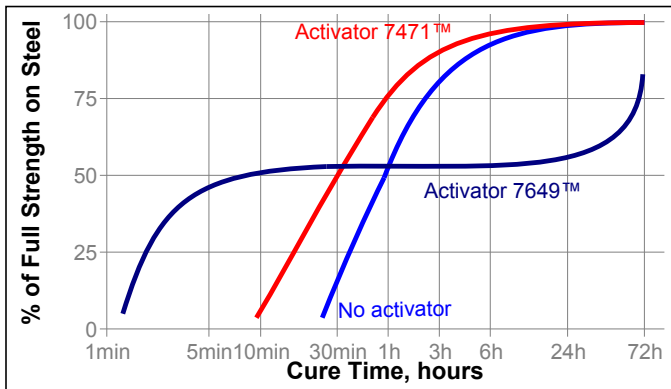
#### Cure Speed vs. Temperature

The rate of cure will depend on the ambient temperature. The graph below shows the shear strength developed with time at different temperatures on grit blasted steel lap shears and tested according to ISO 4587.



**Cure Speed vs. Activator**

Where cure speed is unacceptably long, or large gaps are present, applying activator to the surface will improve cure speed. The graph below shows the shear strength developed with time on grit blasted steel lap shears using Activator 7471™ and 7649™ and tested according to ISO 4587.



**TYPICAL PROPERTIES OF CURED MATERIAL**

**Physical Properties:**

Coefficient of Thermal Expansion, ISO 11359-2, K <sup>-1</sup>	80×10 <sup>-6</sup>
Coefficient of Thermal Conductivity, ISO 8302, W/(m·K)	0.3
Specific Heat, kJ/(kg·K)	0.3

**TYPICAL PERFORMANCE OF CURED MATERIAL**

**Adhesive Properties**

Cured for 24 hours @ 22 °C

Lap Shear Strength, ISO 4587:

Steel (grit blasted)	N/mm <sup>2</sup> ≥3.0 <sup>LMS</sup>
	(psi) (≥435)

Tensile Strength, ISO 6922:

Steel (grit blasted)	N/mm <sup>2</sup> 11
	(psi) (1,600)

**Sealing Capability**

An annular shaped gasket with an inner diameter of 50 mm and an external diameter of 70 mm was tested up to 1.3 MPa for leakage. Hydraulic fluid pressure is applied to determine the burst pressure.

Burst pressure:

Steel:

0.05 mm gap	N/mm <sup>2</sup> 27.5
	(psi) (3,990)
0.1 mm gap	N/mm <sup>2</sup> 20.0
	(psi) (2,900)
Aluminum:	
0.05 mm gap	N/mm <sup>2</sup> 17.5
	(psi) (2,540)
0.1 mm gap	N/mm <sup>2</sup> 12.5
	(psi) (1,810)

**TYPICAL ENVIRONMENTAL RESISTANCE**

The following tests refer to the effect of environment on strength. This is not a measure of sealing performance.

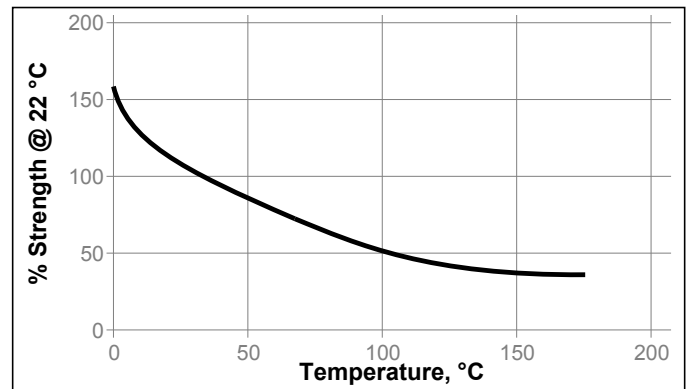
Cured for 1 week @ 22 °C

Lap Shear Strength, ISO 4587:

Steel (grit blasted)

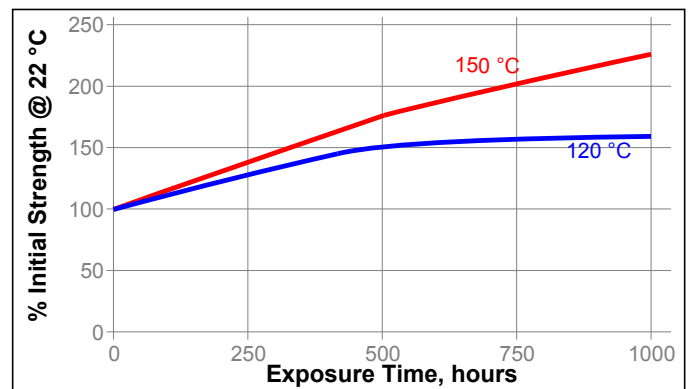
**Hot Strength**

Tested at temperature



**Heat Aging**

Aged at temperature indicated and tested @ 22 °C



**Chemical/Solvent Resistance**

Aged under conditions indicated and tested @ 22°C.

Environment	°C	% of initial strength		
		100 h	500 h	1000 h
Air	22	100	120	130
Motor oil	150	90	180	190
Water/glycol 50/50	87	25	15	25
Unleaded gasoline	22	110	100	100
Auto trans. fluid	150	75	170	190

**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).**

Where aqueous washing systems are used to clean the surfaces before bonding, it is important to check for compatibility of the washing solution with the adhesive. In some cases these aqueous washes can affect the cure and performance of the adhesive.

This product is not normally recommended for use on plastics (particularly thermoplastic materials where stress cracking of the plastic could result). Users are recommended to confirm compatibility of the product with such substrates.

**Directions for use:**

1. For best performance bond surfaces should be clean and free from grease.
2. The product is designed for close fitting flanged parts.
3. Apply manually as a continuous bead or by screen printing to one surface of the flanges.
4. To obtain best results, each application should be evaluated under the specific conditions anticipated for dispensing, performance and durability of the parts.
5. Low pressures (<0.05 MPa) may be used when testing to confirm a complete seal immediately after assembly and before curing.
6. Flanges should be tightened as soon as possible after assembly to avoid shimming.

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

LMS dated January 14, 1997. 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 1.1**