



# LOCTITE® 510™

December 2009

## PRODUCT DESCRIPTION

LOCTITE® 510™ provides the following product characteristics:

<b>Technology</b>	Acrylic
<b>Chemical Type</b>	Dimethacrylate ester
<b>Appearance (uncured)</b>	Opaque pink paste <sup>LMS</sup>
<b>Components</b>	One component - requires no mixing
<b>Viscosity</b>	High
<b>Cure</b>	Anaerobic
<b>Application</b>	Gasketing and sealing
<b>Strength</b>	Medium

LOCTITE® 510™ cures when confined in the absence of air between close fitting metal surfaces. This product is a general gasketing product suitable for hand dispensing or screen printing.

### NSF International

**Registered to NSF Category P1** for use as a sealant where there is no possibility of food contact in and around food processing areas. **Note:** This is a regional approval. Please contact your local Technical Service Center for more information and clarification.

### TYPICAL PROPERTIES OF UNCURED MATERIAL

- Specific Gravity @ 25 °C 1.1
- Flash Point - See MSDS
- Viscosity, Brookfield - HBT, 25 °C, mPa·s (cP):
  - Spindle TC, speed 2.5 rpm, Helipath 200,000 to 750,000<sup>LMS</sup>
  - Spindle TC, speed 20 rpm, Helipath 40,000 to 140,000<sup>LMS</sup>

### Instant Sealing Capability

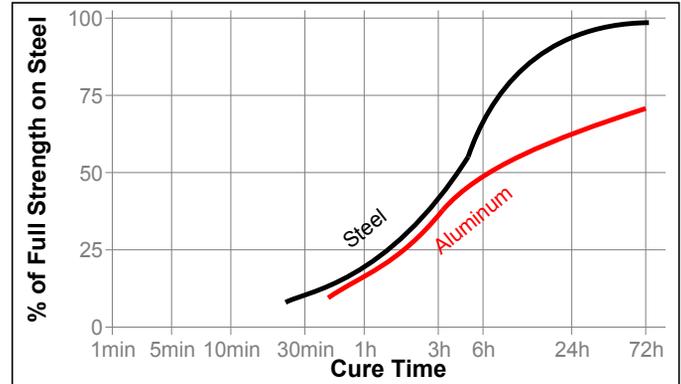
Anaerobic sealants have the ability to resist low on-line test pressures while uncured. This test was performed with uncured product immediately after assembly of an annular polycarbonate sealing surface with an internal diameter of 50 mm and an external diameter of 70 mm.

- Pressure Resistance, MPa:
- Induced Gap 0 mm 0.02
  - Induced Gap 0.125 mm 0.01
  - Induced Gap 0.25 mm 0.01

### TYPICAL CURING PERFORMANCE

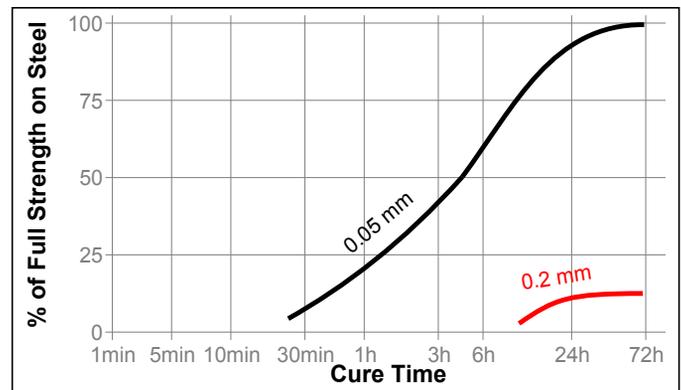
#### Cure Speed vs. Substrate

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.



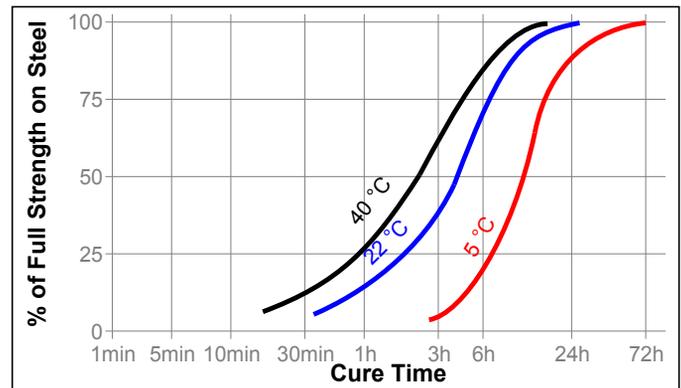
#### Cure Speed vs. Bond Gap

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



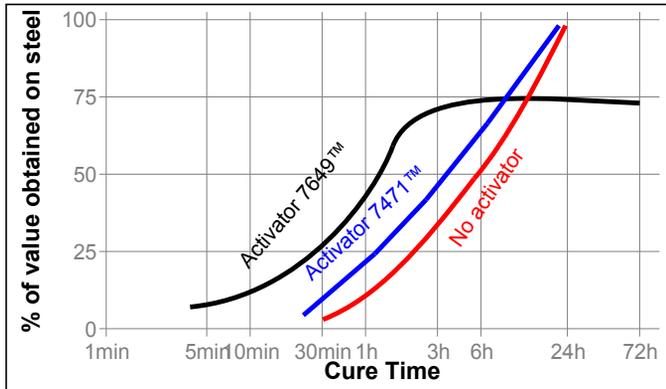
#### Cure Speed vs. Temperature

The rate of cure will depend on the 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)	0.1
Specific Heat, kJ/(kg·K)	0.3

**TYPICAL PERFORMANCE OF CURED MATERIAL**

**Adhesive Properties**

Cured for 1 hour @ 22 °C

Compressive Shear Strength, ISO 10123:	
Steel pins and collars (grit blasted)	N/mm <sup>2</sup> ≥1 <sup>LMS</sup> (psi) (≥145)

Cured for 24 hours @ 22 °C

Compressive Shear Strength, ISO 10123:	
Steel pins and collars (grit blasted)	N/mm <sup>2</sup> ≥7.5 <sup>LMS</sup> (psi) (≥1,085)

Lap Shear Strength, ISO 4587:

Steel (grit blasted)	N/mm <sup>2</sup> 5 (psi) (725)
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Tensile Strength, ISO 6922:

Steel (grit blasted)	N/mm <sup>2</sup> 7.5 (psi) (1,085)
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**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.

Sealed to Maximum Induced Gap, mm:

Mild steel	≤0.125
Aluminum 2011T3	≤0.125

**TYPICAL ENVIRONMENTAL RESISTANCE**

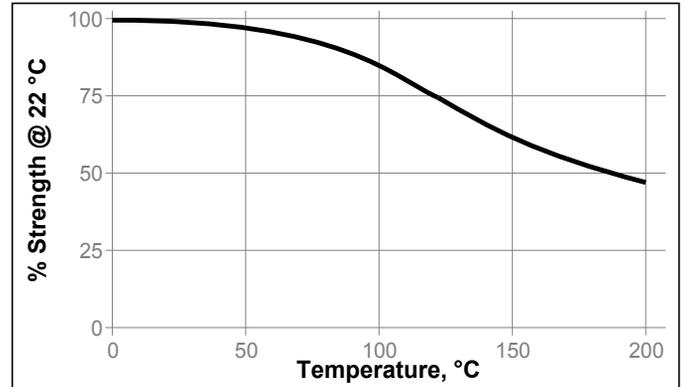
The following tests refer to the effect of environment on strength. This is not a measure of sealing performance.

Cured for 1 week @ 22 °C

Lap Shear Strength, ISO 4587:  
Steel (grit blasted)

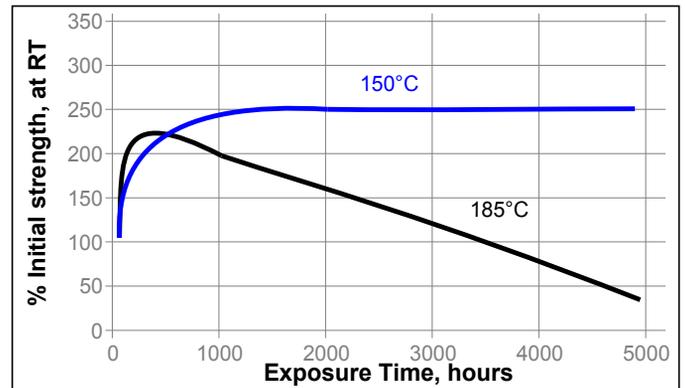
**Hot Strength**

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
Motor oil (MIL-L-46152)	125	100	100	100
Unleaded Petrol	22	95	60	60
Water/glycol 50/50	87	160	110	110

**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 Material Safety Data Sheet (MSDS).**

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 with gaps up to 0.25 mm.
3. Apply manually as a continuous bead or by screen printing to one surface of the flanges.
4. Low pressures (<0.05 MPa) may be used when testing to confirm a complete seal immediately after assembly and before curing.
5. Flanges should be tightened as soon as possible after assembly to avoid shimming.

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

LMS dated November 13, 1998. 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**

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

**Note**

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Reference 0.3