

LOCTITE® 515™

August 2016

PRODUCT DESCRIPTION

LOCTITE® 515™ provides the following product characteristics:

| | |
|-----------------------------|--|
| Technology | Acrylic |
| Chemical Type | Methacrylate ester |
| Appearance (uncured) | Opaque, dark purple ^{LMS} |
| Fluorescence | Positive under UV light ^{LMS} |
| Components | One component - requires no mixing |
| Viscosity | High |
| Cure | Anaerobic |
| Application | Sealing |

LOCTITE® 515™ cures when confined in the absence of air between close fitting metal surfaces. It seals close fitting joints between rigid metal faces and flanges and will flex with minor flange movements. Provides resistance to low pressures immediately after assembly of flanges. Typically used as a form-in-place gasket for pumps, thermostats, compressors, transmission housings and axle covers.

UL Classification

Classified by Underwriters Laboratories Inc.® MH8007 - Fire hazard is small. No flash point in liquid state. Ignition temperature 467°C. For use in devices handling gasoline, petroleum oils, natural gas (pressure not over 300 PSIG), butane and propane not exceeding 2 in. pipe size. **Note:** This is a regional approval. Please contact your local Technical Service Center for more information and clarification.

Approved by the Australian Gas Association Certificate number 2590 Class II rated working pressure 500 kPa, working temperature -10 to 150°C. **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

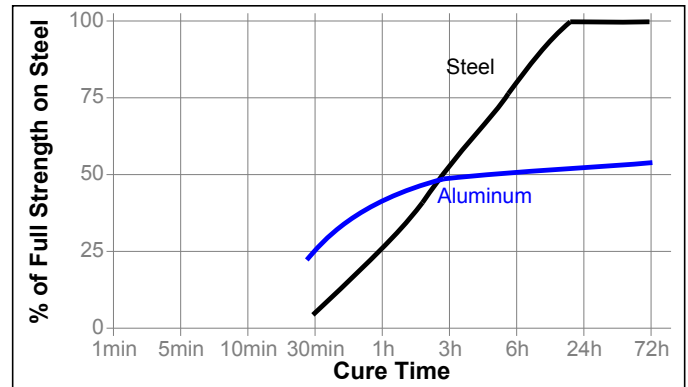
Viscosity, Brookfield - HBT, 25 °C, mPa·s (cP):
 Spindle TB, speed 0.5 rpm, Helipath 700,000 to 1,700,000^{LMS}
 Spindle TB, speed 5.0 rpm, Helipath 150,000 to 375,000^{LMS}

Flash Point - See SDS

TYPICAL CURING PERFORMANCE

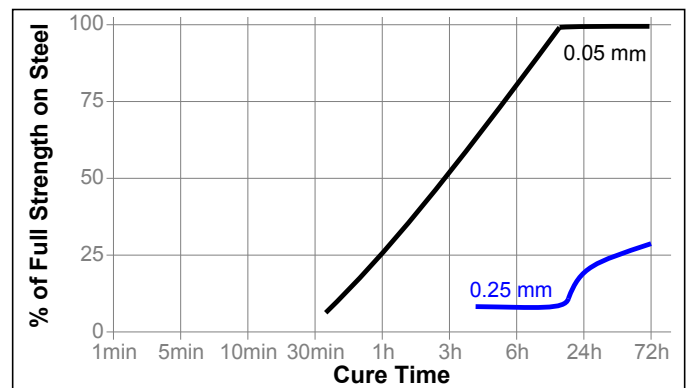
Cure Speed vs. Substrate

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.



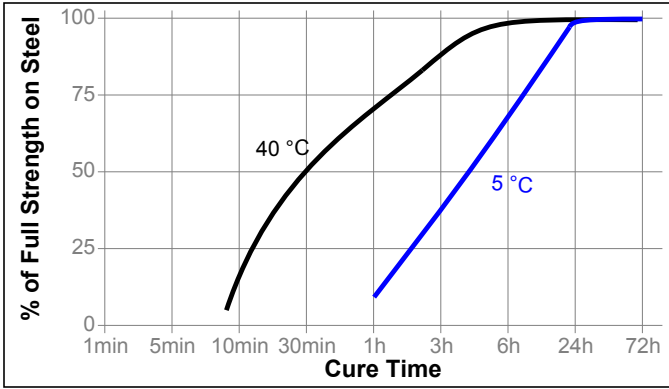
Cure Speed vs. Bond Gap

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



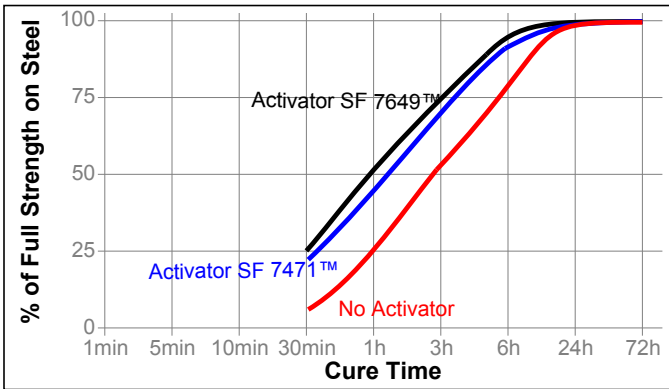
Cure Speed vs. Temperature

The rate of cure will depend on the ambient temperature. The graph below shows the shear strength developed with time on grit blasted steel lap shears at different temperatures 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 SF 7471™ and SF 7649™ and tested according to ISO 4587.



TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties:

| | |
|--|---------------------|
| Coefficient of Thermal Expansion, ISO 11359-2, K ⁻¹ | 80×10 ⁻⁶ |
| 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 | N/mm ² ≥5.0 ^{LMS} (psi) (≥725) |

Cured for 24 hours @ 22 °C

| | |
|--|---|
| Compressive Shear Strength, ISO 10123: | |
| Steel pins and collars | N/mm ² ≥5.0 ^{LMS} (psi) (≥725) |

| | |
|-------------------------------|--------------------------------------|
| Lap Shear Strength, ISO 4587: | |
| Steel (grit blasted) | N/mm ² 6.0 (psi) (870) |

| | |
|-----------------------------|---------------------------------------|
| Tensile Strength, ISO 6922: | |
| Steel (grit blasted) | N/mm ² 14 (psi) (2,030) |

Cured for 24 hours @ 90 °C, tested @ 22 °C

| | |
|-------------------------------|---|
| Lap Shear Strength, ISO 4587: | |
| Steel (grit blasted) | N/mm ² ≥6.9 ^{LMS} (psi) (≥1,000) |

TYPICAL ENVIRONMENTAL RESISTANCE

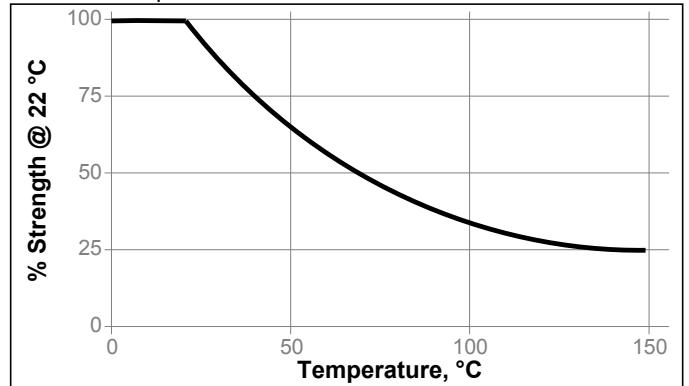
The following tests refer to the effect of environment on strength. This is not a measure of sealing performance.

Cured for 1 week @ 22 °C.

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

Hot Strength

Tested at temperature

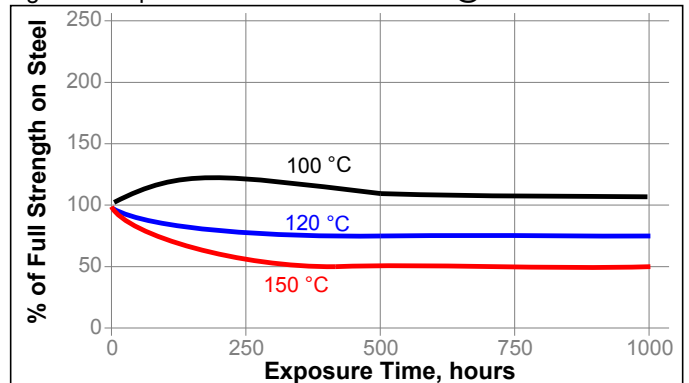


Cold Strength

This product has been tested to -75°C (-100 F). This product may work below this temperature, but has not been tested.

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 | |
|--------------------|-----|-----------------------|--------|
| | | 500 h | 1000 h |
| Motor oil | 125 | 160 | 165 |
| Gasoline | 22 | 20 | 15 |
| Water/glycol 50/50 | 87 | 80 | 80 |
| DEF (AdBlue®) | 22 | 60 | 60 |

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 with gaps up to 0.25 mm (0.01 in).
3. Apply manually as a continuous bead or by screen printing to one surface of the flanges.
4. Low pressures (<0.05 MPa, <7.3 psi) 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^{LMS}

LMS dated January 14, 2000. 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:

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.

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Reference 1.3