Technical Data Sheet

LOCTITE® 518™

(TDS for the new formulation of LOCTITE® 518™) January 2016

PRODUCT DESCRIPTION

LOCTITE® 518™ provides the following product characteristics:

Technology	Acrylic
Chemical Type	Dimethacrylate ester
Appearance (uncured)	Red gel-like material[LMS]
Fluorescence	Positive under UV light[LMS]
Components	One component - requires no mixing
Viscosity	Thixotropic
Cure	Anaerobic
Cure Benefit	Room temperature cure
Application	Sealing

This Technical Data Sheet is valid for LOCTITE® 518™ manufactured from the dates outlined in the "Manufacturing Date Reference" section.

LOCTITE® 518™ is a single component, medium strength, anaerobic sealant which cures when confined in the absence of air between close fitting metal surfaces. Typical applications include sealing close fitting joints between rigid metal faces and flanges. Provides resistance to low pressures immediately after assembly of flanges. Typically used as a form-in-place gasket on rigid flanged connections, e.g. gearbox and engine casings, etc. The thixotropic nature of LOCTITE® 518™ reduces the migration of liquid product after application to the substrate. LOCTITE® 518™ provides robust curing performance. It not only works on active metals (e.g. mild steel) but also on passive substrates such as aluminum with a low copper content. The product offers gap performance to 0.25 mm (0.01 in) and contamination tolerance. It cures in the presence of minor surface contaminations from various oils, such as cutting, lubrication, anti-corrosion and protection fluids and cleaners containing surfactants and corrosion inhibitors.

NSF International
Registered to NSF Category P1 for use as a sealant where there is no possibilty 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.

NSF International
Certified to ANSI/NSF Standard 61 for use in commercial and residential potable water systems not exceeding 82° 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
Flash Point - See SDS	
Viscosity, Brookfield - HBT, 25 °C, mPa·s (cP):	
Spindle TC, speed 0.5 rpm, Helipath	3,000,000 to 4,500,000[LMS]
Spindle TC, speed 5.0 rpm, Helipath	500,000 to 1,000,000[LMS]

Instant Sealing Capability

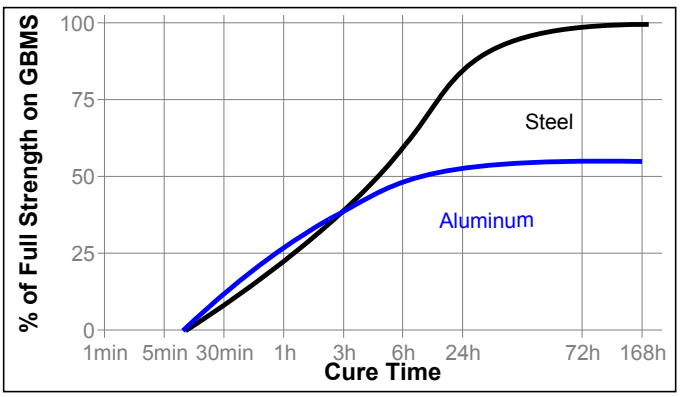
Anaerobic sealants have the ability to resist low on-line test pressures while uncured. This test was performed with uncured product immediately after assembly of an annular steel sealing surface with an internal diameter of 50 mm (2 in) and an external diameter of 70 mm (2.8 in).

Pressure Resistance, MPa:	
Induced Gap 0.05 mm	1.35
Induced Gap 0.125 mm	0.14
Induced Gap 0.25 mm	0.1

TYPICAL CURING PERFORMANCE

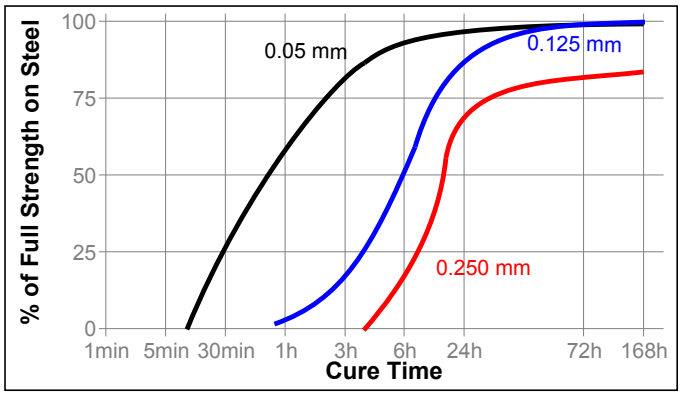
Cure Speed vs. Substrate

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.



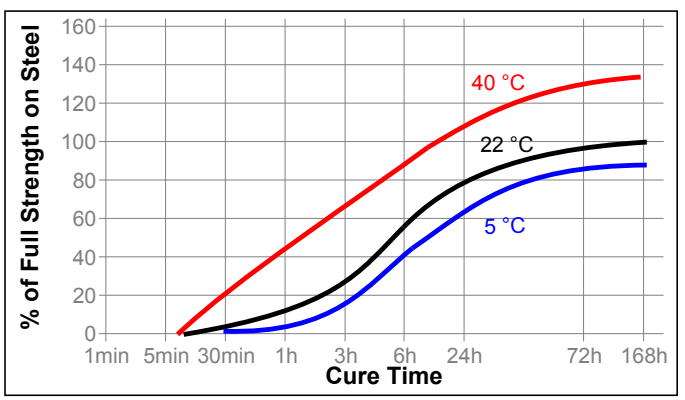
Cure Speed vs. Bond Gap

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.



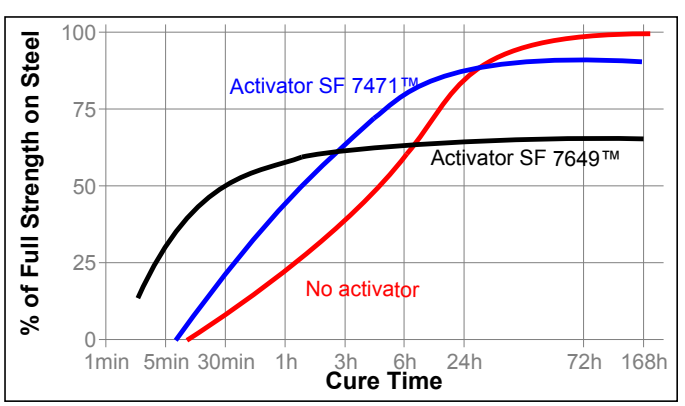
Cure Speed vs. Temperature

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

Cured for 1 week @ 22 °C

Physical Properties:

Coefficient of Thermal Expansion, ISO 11359-2, K^{-1}			215×10^{-06}
Elongation, at break, ISO 527-2, %			64
Tensile Strength, ISO 527-2	N/mm²	7.3	
	(psi)	(1,060)	
Tensile Modulus, ISO 527-2	N/mm²	54	
	(psi)	(7,850)	

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 1 hour @ 22 °C

Compressive Shear Strength, ISO 10123:

Steel pins and collars	N/mm²	≥5.0[LMS]
	(psi)	(≥725)

Cured for 24 hours @ 22 °C

Compressive Shear Strength, ISO 10123:

Steel pins and collars	N/mm²	≥5.0[LMS]
	(psi)	(≥725)

Lap Shear Strength, ISO 4587:

Mild Steel (grit blasted)	N/mm²	8.4
	(psi)	(1,220)
Mild Steel	N/mm²	5.5
	(psi)	(800)
Aluminum	N/mm²	5.4
	(psi)	(780)
Aluminum (Alclad)	N/mm²	2.2
	(psi)	(320)
Mild Steel (grit blasted) to Aluminum	N/mm²	6.7
	(psi)	(970)

Cured for 1 week @ 22 °C

Lap Shear Strength, ISO 4587:

Mild Steel (grit blasted)	N/mm²	11
	(psi)	(1,525)
Mild Steel	N/mm²	5.5
	(psi)	(800)
Aluminum	N/mm²	5.8
	(psi)	(840)
Aluminum (Alclad)	N/mm²	1.6
	(psi)	(230)
Mild Steel (grit blasted) to Aluminum	N/mm²	6.7
	(psi)	(970)

Tensile Strength, ISO 6922:

Grit blasted mild steel pin	N/mm²	10
	(psi)	(1,480)
Aluminum pins	N/mm²	13
	(psi)	(1,930)

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 (immersion in water for 1 minute). Product was cured for 20 hours.

Sealed to Maximum Induced Gap, mm:

Mild steel	0.25
Aluminum	0.25

TYPICAL ENVIRONMENTAL RESISTANCE

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

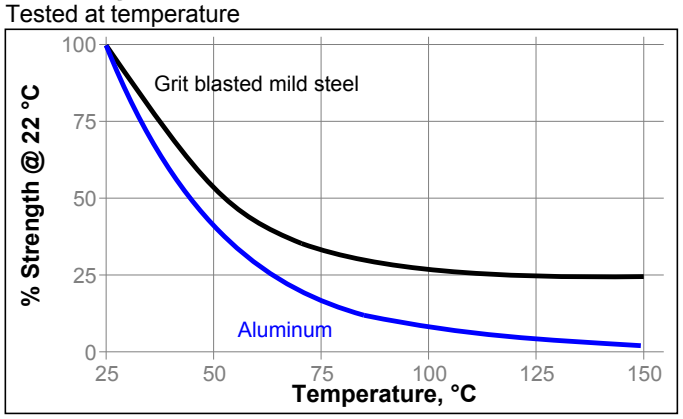
Cured for 1 week @ 22 °C.

Lap Shear Strength, ISO 4587:

Steel (grit blasted)

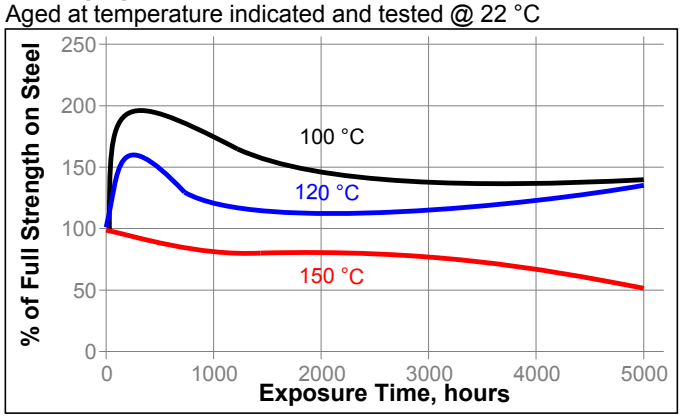
Hot Strength

Tested at temperature



Heat Aging

Aged at temperature indicated and tested @ 22 °C



Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 22 °C

		% of initial strength			
Environment	**°C**	**500 h**	**1000 h**	**3000 h**	**5000 h**
Motor oil (5W30 -Synthetic)	120	175	115	110	145
Motor oil (5W30 -Synthetic)	150	55	50	50	50
Water/glycol 50/50	87	80	65	65	55
ATF	120	175	100	105	140
ATF	150	60	40	40	40
Unleaded gasoline	22	15	10	10	5
DEF (AdBlue®)	22	95	65	70	85

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 and other contaminants.
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 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 October 15, 2015. 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.

Manufacturing Date Reference

This Technical Data Sheet is valid for LOCTITE® 518™ manufactured from the dates below:

The manufacturing date can be determined from the batch code on the pack. For assistance please contact your local Technical Service Center or Customer Service Representative.

Made in:	**First manufacturing date**:
U.S.A.	May 2016
EU	February 2016
India	May 2016
China	May 2016
Brazil	April 2016

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/mm² 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.
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Reference 1.4