LOCTITE® 5205™

August 2005

PRODUCT DESCRIPTION

LOCTITE® 5205™ provides the following product characteristics:

Technology	Acrylic
Chemical Type	Dimethacrylate ester
Appearance (uncured)	Viscous red liquid[LMS]
Fluorescence	Positive under UV light[LMS]
Components	One component - requires no mixing
Viscosity	High
Cure	Anaerobic
Application	Sealing
Strength	Medium
Specific Benefit	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 MSDS	
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^{-1}	30,000 to 75,000[LMS]

Instant Sealing Capability

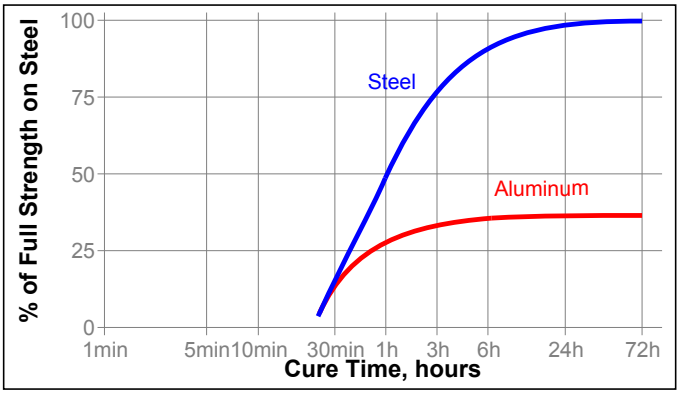
Anaerobic sealants have the ability to resist low on-line test pressures while uncured. This test was performed with uncured product immediately after assembly of a glass plate and an annular zinc dichromate flange before cure occurred. The pressure was maintained for 1 minute.

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

TYPICAL CURING PERFORMANCE

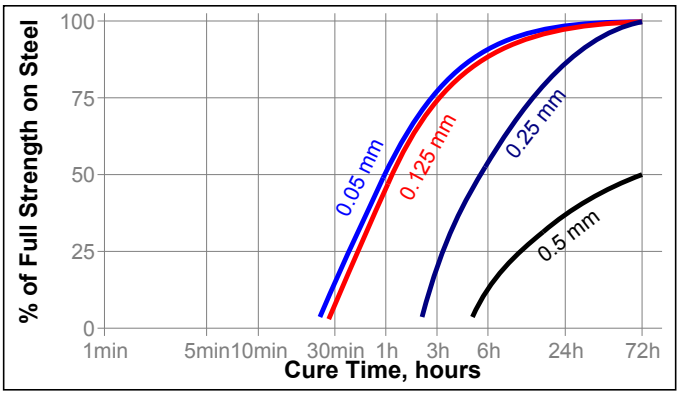
Cure Speed vs. Substrate

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.



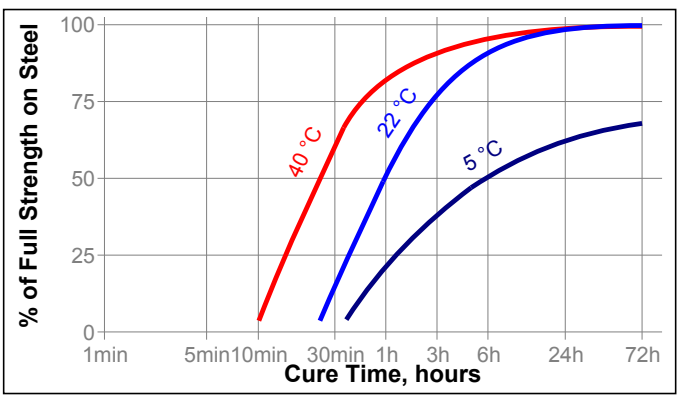
Cure Speed vs. Bond Gap

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.



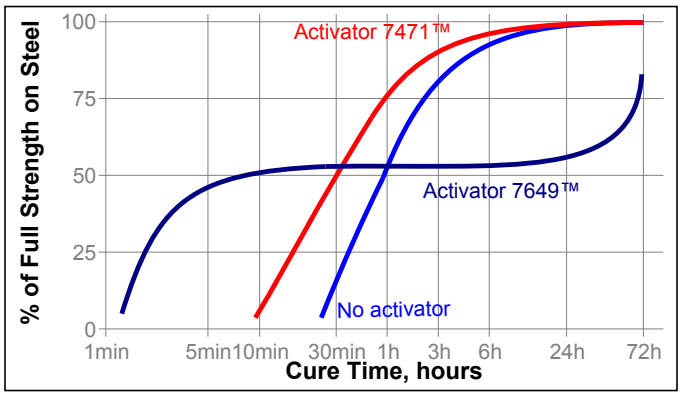
Cure Speed vs. Temperature

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, ASTM D 696, K^{-1}	80×10^{-6}
Coefficient of Thermal Conductivity, ASTM C177, 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/mm²	≥3.0[LMS]
	(psi)	(≥435)
Tensile Strength, ISO 6922:		
Steel (grit blasted)	N/mm²	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/mm²	27.5
	(psi)	(3,990)
0.1 mm gap	N/mm²	20.0
	(psi)	(2,900)
Aluminum:		
0.05 mm gap	N/mm²	17.5
	(psi)	(2,540)
0.1 mm gap	N/mm²	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.

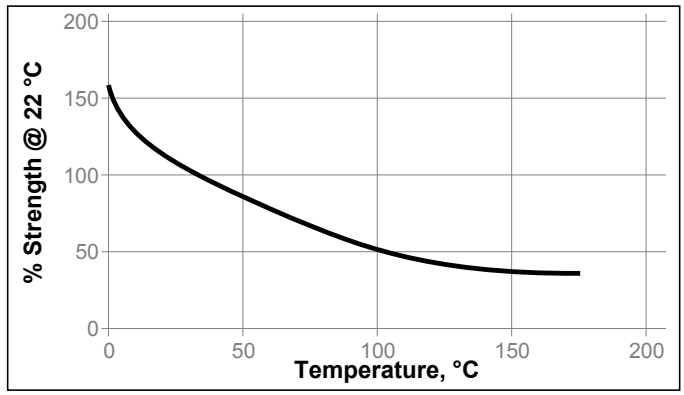
Cured for 1 week @ 22 °C

Lap Shear Strength, ISO 4587:

Steel (grit blasted)

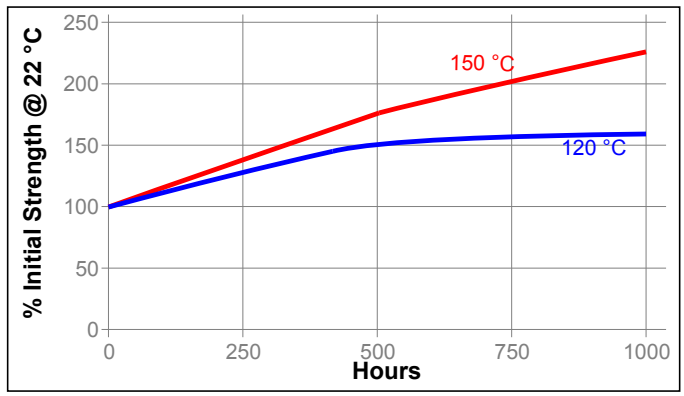
Hot Strength

Tested at temperature



Heat Aging

Aged at temperature indicated and tested @ 22 °C



Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 22°C.

		% of initial strength		
Environment	**°C**	**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 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.
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[LMS]

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/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

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Trademark usage

Reference 1.0