

Research, Development & Engineering

Tallaght Business Park,
Dublin, Ireland

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PRODUCT DESCRIPTION

LOCTITE[®] Product 510 is a single component, medium strength, anaerobic sealant with good heat resistance. The product cures at ambient temperature when confined in the absence of air between close fitting metal surfaces. A robotic dispense version of 510, product 5101 is also available with identical performance to 510.

TYPICAL APPLICATIONS

Seals close fitting joints between rigid metal faces and flanges. Particularly suited where maximum temperature and chemical resistance is required.

PROPERTIES OF UNCURED MATERIAL

	Value	Typical Range
Chemical Type	Dimethacrylate ester	
Appearance	Red/Pink	
Specific Gravity @ 25 °C	1.16	
Viscosity @ 25 °C, Pa.s		
Brookfield HB		
TC @ 2.5 rpm	500	200 to 700
@ 20 rpm	100	40 to 160
DIN 54453, SV		
D = 20 s ⁻¹ after t=180secs	12,000	8,000 to 16,000
Flash Point (TCC), °C	>93	

Instant Seal

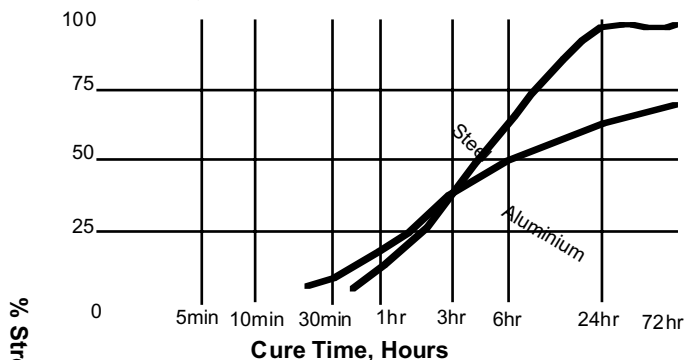
Anaerobic sealants have the ability to resist low on-line test pressures while uncured. This test was performed with uncured product immediately after assembly of an annular polycarbonate sealing surface with an internal diameter of 50mm and an external diameter of 70mm.

Induced Gap, mm	Pressure Resistance, N/mm ²
0.0	0.02
0.125	0.01
0.25	0.01

TYPICAL CURING PERFORMANCE

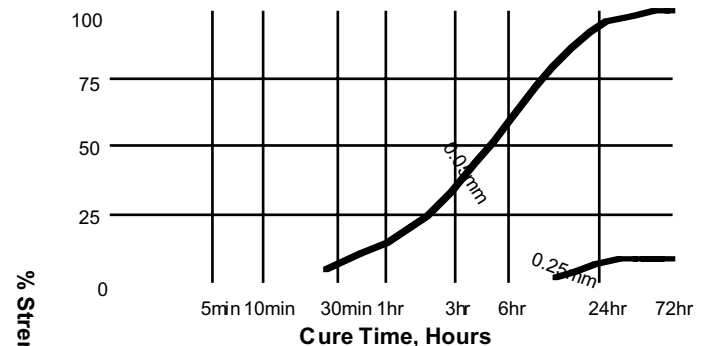
Cure speed vs. substrate

The rate of cure will depend on 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 ASTM D1002.



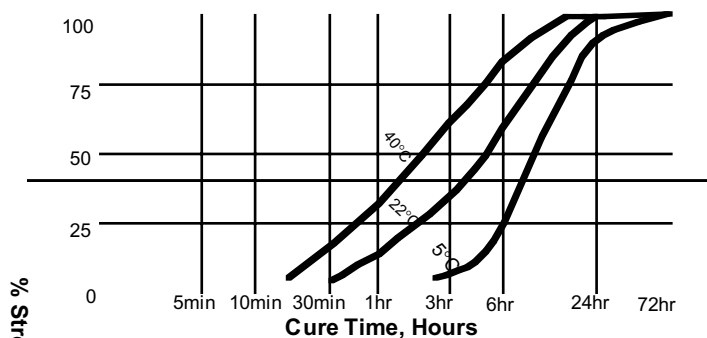
Cure speed vs. bond gap

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.



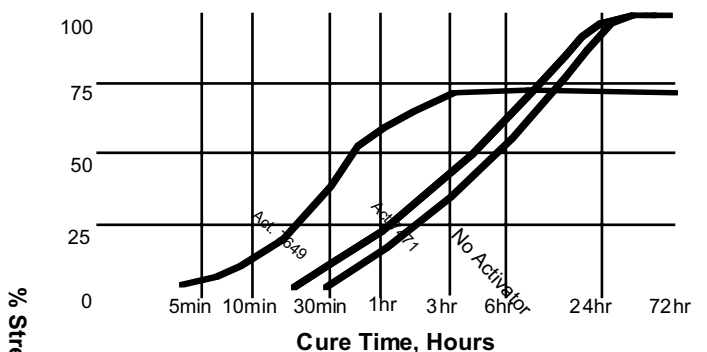
Cure speed vs. temperature

The rate of cure will depend on the 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 ASTM D1002.



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 using ACTIVATOR N and T on grit blasted steel lap shears and tested according to ASTM D1002.



TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties

Coefficient of thermal expansion, ASTM D696, K ⁻¹	80 x 10 ⁻⁶
Coefficient of thermal conductivity, ASTM C177, W.m ⁻¹ K ⁻¹	0.1
Specific Heat, kJ.kg ⁻¹ K ⁻¹	0.3

PERFORMANCE OF CURED MATERIAL

(After 24 hr at 22_C, on grit blasted mild steel)

	Value	Typical Range
Shear Strength, ASTM D1002, N/mm_ (psi)	5 (725)	3 to 7 (435 to 1015)
Shear Strength, DIN EN 1465, N/mm_ (psi)	7 (1015)	4 to 10 (580 to 1450)
Tensile Strength, DIN EN 26922, N/mm_ (psi)	7.5 (1087)	2 to 13 (290 to 1885)

Sealing Capability

An annular shaped gasket with an inner diameter of 50mm and an external diameter of 70mm is tested up to 1.3 N/mm_ (13.5bar) for leakage.

Substrate	Seals Induced Gap up to :
Mild Steel	≤ 0.125mm
Aluminium 2011T3	≤ 0.125mm

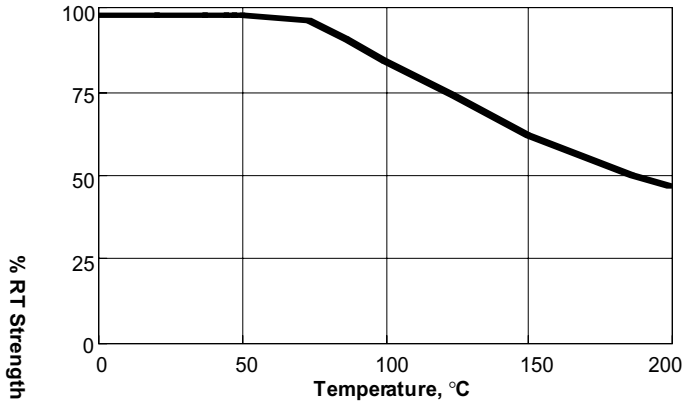
TYPICAL ENVIRONMENTAL RESISTANCE

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

Test Procedure : Shear Strength, ASTM D1002
 Substrate: Grit Blasted Mild Steel Laps
 Cure procedure: 24hrs at RT + 24hrs at temperature

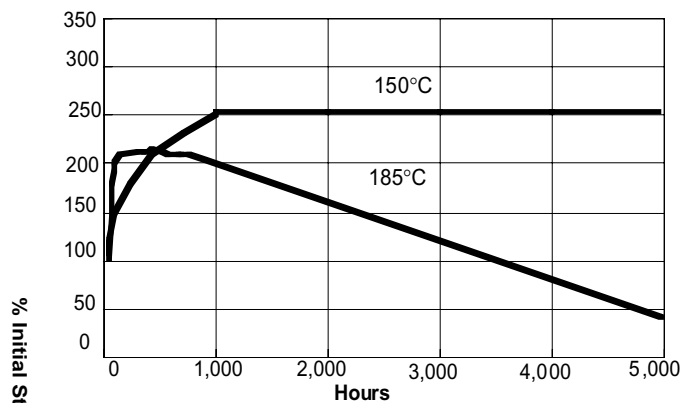
Hot Strength

Tested at temperature.



Heat Ageing

Aged at temperature indicated and tested at 22°C.



Chemical / Solvent Resistance

Aged under conditions indicated and tested at 22°C.

Solvent	Temp.	% Initial Strength retained at		
		100 hr	500 hr	1000 hr
Motor Oil	125_C	100	100	100
Unleaded Petrol	22_C	95	60	60
Water/Glycol (50%/50%)	87_C	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 oxidising 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

For best performance surfaces should be clean and free of grease. The product is designed for close fitting flanged parts with gaps up to 0.25mm. Apply manually as a continuous bead or by screen printing to one surface of the flanges. Low pressures (<0.5bar) may be used when testing to confirm a complete seal immediately after assembly and before curing. Flanges should be tightened as soon as possible after assembly to avoid shimming.

Storage

Product shall be ideally stored in a cool, dry location in unopened containers at a temperature between 8_C to 28_C (46_F to 82_F) unless otherwise labelled. Optimal storage is at the lower half of this temperature range. To prevent contamination of unused product, do not return any material to its original container. For further specific shelf life information, contact your local Technical Service Centre.

Data Ranges

The data contained herein may be reported as a typical value and/or range (based on the mean value ± 2 standard deviations). Values are based on actual test data and are verified on a periodic basis.

Note

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, Loctite Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Loctite Corporation's products. Loctite 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 licence under any Loctite 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.