Technical Data Sheet

LOCTITE® 270™

(TDS for new formulation of Loctite® 270™) December 2013

PRODUCT DESCRIPTION

LOCTITE® 270™ provides the following product characteristics:

Technology	Acrylic
Chemical Type	Dimethacrylate ester
Appearance (uncured)	Green liquid[LMS]
Fluorescence	Positive under UV light[LMS]
Components	One component - requires no mixing
Viscosity	Low
Cure	Anaerobic
Secondary Cure	Activator
Application	Threadlocking
Strength	High

LOCTITE® 270™ is designed for the permanent locking and sealing of threaded fasteners. The product cures when confined in the absence of air between close fitting metal surfaces and prevents loosening and leakage from shock and vibration. LOCTITE® 270™ is particularly suited for heavy duty applications such as studs into motor housings, nuts onto studs in pump housings and other fasteners where high strength is required. LOCTITE® 270™ provides robust curing performance. It not only works on active metals (e.g. brass, copper) but also on passive substrates such as stainless steel and plated surfaces. The product offers high temperature performance and oil tolerance. It tolerates minor surface contaminations from various oils, such as cutting, lubrication, anti-corrosion and protection fluids.

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.

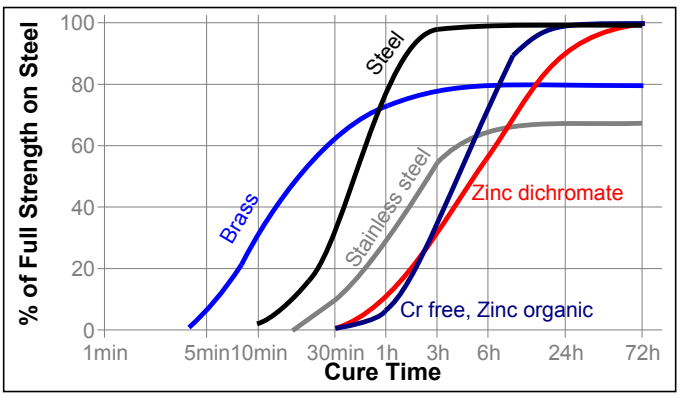
TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.1
Flash Point - See SDS	
Viscosity, Brookfield - RVT, 25 °C, mPa·s (cP):	
Spindle 2, speed 20 rpm,	400 to 600[LMS]
Viscosity, Cone & Plate, 25 °C, mPa·s (cP):	
Cone C60/1°Ti @ shear rate 129 s^{-1}	450

TYPICAL CURING PERFORMANCE

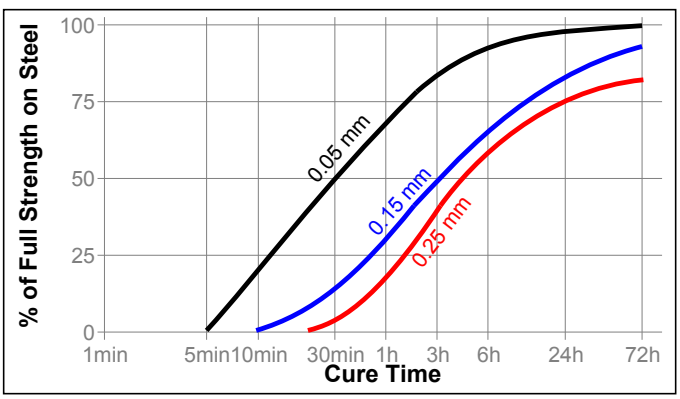
Cure Speed vs. Substrate

The rate of cure will depend on the substrate used. The graph below shows the breakaway strength developed with time on M10 steel nuts and bolts. compared to different materials and tested according to ISO 10964.

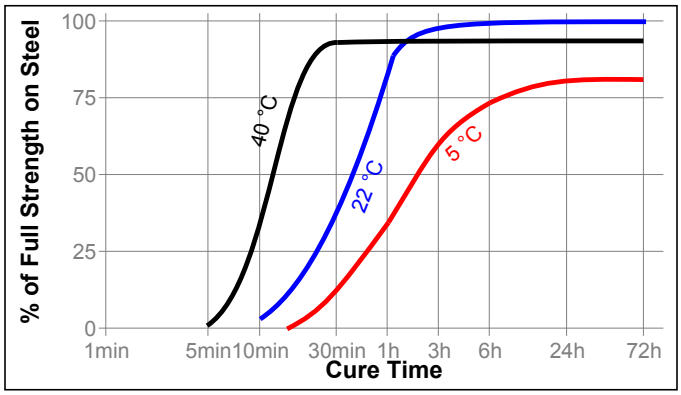


Cure Speed vs. Bond Gap

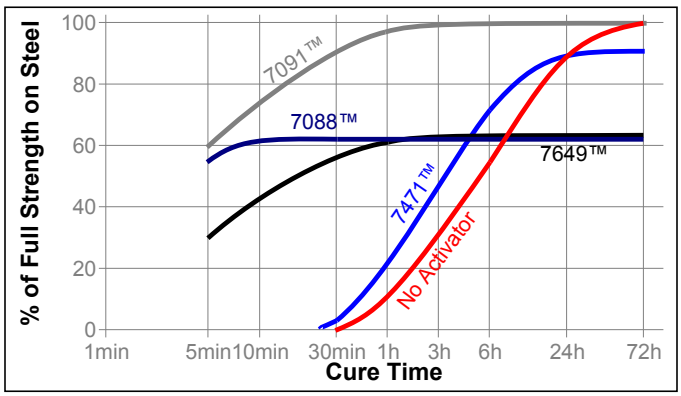
The rate of cure will depend on the bondline gap. Gaps in threaded fasteners depends on thread type, quality and size. The following graph shows shear strength developed with time on steel pins and collars at different controlled gaps and tested according to ISO 10123.



Cure Speed vs. Temperature
The rate of cure will depend on the temperature. The graph below shows the breakaway strength developed with time at different temperatures on M10 steel nuts and bolts and tested according to ISO 10964.



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 breakaway strength developed with time on M10 zinc dichromate steel nuts and bolts using Activator 7471™, 7649™, 7088™ and 7091™ and tested according to ISO 10964.



TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 24 hours @ 22 °C

Breakaway Torque, ISO 10964, Unseated:

M10 steel nuts and bolts	N·m	33
	(lb.in.)	(290)
M6 steel nuts and bolts	N·m	5
	(lb.in.)	(45)
M16 steel nuts and bolts	N·m	90
	(lb.in.)	(800)
3/8 x 16 steel nuts (grade 2) and bolts (grade 5)	N·m	31
	(lb.in.)	(275)

Prevail Torque @ 180°, ISO 10964, Unseated:

M10 steel nuts and bolts	N·m	33
	(lb.in.)	(290)
M6 steel nuts and bolts	N·m	3
	(lb.in.)	(26)
M16 steel nuts and bolts	N·m	125
	(lb.in.)	(1,100)
3/8 x 16 steel nuts (grade 2) and bolts (grade 5)	N·m	33
	(lb.in.)	(290)

Breakloose Torque, ISO 10964, Pre-torqued to 5 N·m:

M10 steel nuts and bolts	N·m	39
	(lb.in.)	(345)
3/8 x 16 steel nuts (grade 2) and bolts (grade 5)	N·m	35
	(lb.in.)	(310)

Prevail Torque @ 180°, ISO 10964, Pre-torqued to 5 N·m:

M10 steel nuts and bolts	N·m	25
	(lb.in.)	(220)
3/8 x 16 steel nuts (grade 2) and bolts (grade 5)	N·m	31
	(lb.in.)	(275)

Compressive Shear Strength, ISO 10123:

Steel pins and collars	N/mm²	≥9.0[LMS]
	(psi)	(≥1,305)

Cured for 1 week @ 22ºC,

Breakloose Torque, ISO 10964, Pre-torqued to 5 N·m:

M10 zinc phosphate nuts and bolts	N·m	46
	(lb.in.)	(400)
M10 stainless steel nuts and bolts	N·m	30
	(lb.in.)	(265)

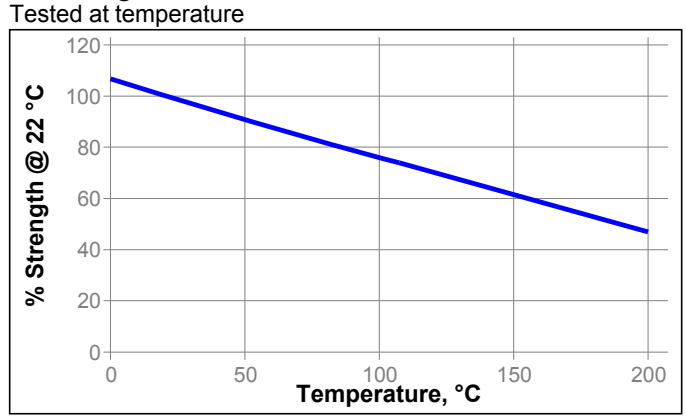
TYPICAL ENVIRONMENTAL RESISTANCE

Cured for 1 week @ 22 °C

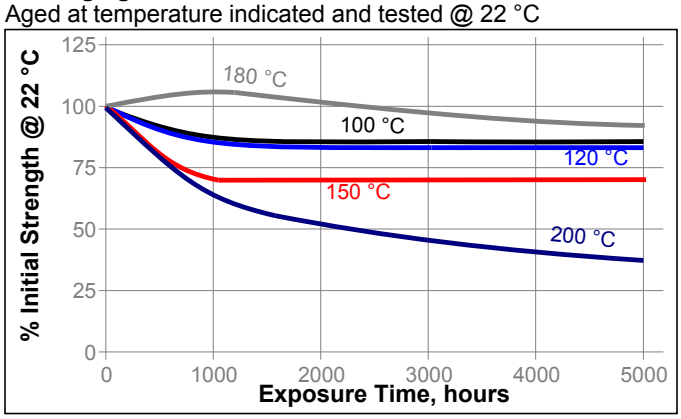
Breakloose Torque, ISO 10964, Pre-torqued to 5 N·m:

M10 zinc phosphate steel nuts and bolts

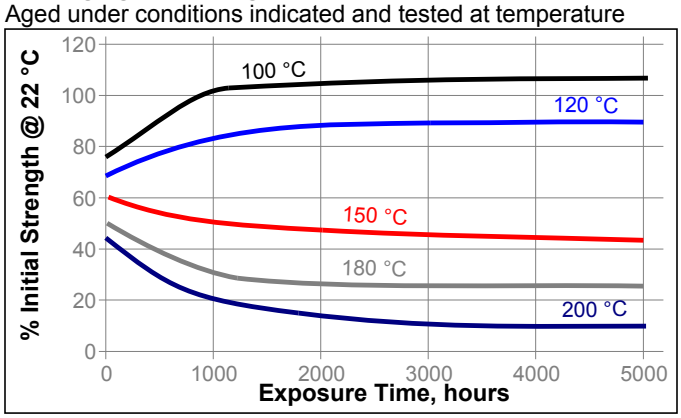
Hot Strength
Tested at temperature



Heat Aging
Aged at temperature indicated and tested @ 22 °C



Heat Aging/Hot Strength
Aged under conditions indicated and tested at temperature



Chemical/Solvent Resistance
Aged under conditions indicated and tested @ 22 °C.

		% of initial strength		
Environment	**°C**	**500 h**	**1000 h**	**5000 h**
Motor oil	125	65	75	75
Unleaded gasoline	22	90	95	95
Brake fluid	22	105	105	100
Water/glycol 50/50	87	75	85	90
Acetone	22	95	95	100
Ethanol	22	95	95	95
E85 Ethanol fuel	22	95	95	95
B100 Bio-Diesel	22	100	100	110

Breakloose Torque, ISO 10964, Pre-torqued to 5 N·m:
M10 Stainless steel nuts and bolts

		% of initial strength		
Environment	**°C**	**500 h**	**1000 h**	**5000 h**
Sodium Hydroxide, 20%	22	75	65	55
Phosphoric Acid, 10%	22	100	95	65

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:

For Assembly

1. For best results, clean all surfaces (external and internal) with a LOCTITE® cleaning solvent and allow to dry.
2. If the cure speed is too slow, use appropriate activator. Please see the Cure Speed vs. Activator graph for reference. Allow the activator to dry when needed.
3. To prevent the product from clogging in the nozzle, do not allow the tip to touch metal surfaces during application.
4. **For Thru Holes**, apply several drops of the product onto the bolt at the nut engagement area.
5. **For Blind Holes**, apply several drops of the product to the lower third of the internal threads in the blind hole, or the bottom of the blind hole.
6. **For Sealing Applications**, apply a 360° bead of product to the leading threads of the male fitting, leaving the first thread free. For bigger threads and voids, adjust product amount accordingly and apply a 360° bead of product on the female threads also.
7. Assemble and tighten as required.

For Disassembly

1. Remove with standard hand tools.
2. In rare instances where hand tools do not work because of excessive engagement length, apply localized heat to nut or bolt to approximately 250 °C. Disassemble while hot.
3. Apply localized heat to the assembly to approximately 250 °C. Disassemble while hot.

For Cleanup

1. Cured product can be removed with a combination of soaking in a Loctite solvent and mechanical abrasion such as a wire brush.

Loctite Material Specification[LMS]
LMS dated June 26, 2009. 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:
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 0.2