



LOCTITE® 2040™

November 2007

PRODUCT DESCRIPTION

LOCTITE® 2040™ provides the following product characteristics:

Technology	Acrylic
Chemical Type	Methacrylate ester
Appearance (uncured)	Red, homogeneous, viscous liquid ^{LMS}
Components	One component - requires no mixing
Viscosity	Medium
Cure	Anaerobic
Application	Threadlocking

LOCTITE® 2040™ is a general purpose medium to high strength pre-applied threadlocker with good substrate compatibility, suitable for use on plain and passivated metal surfaces. The pre-applied film is dry-to-the-touch and remains an inert coating until assembly. During assembly, microcapsules, which are contained within the coating, are crushed thereby releasing an active ingredient which initiates the curing process. LOCTITE® 2040™ prevents loosening of threaded fasteners. It is particularly suitable in situations where threaded parts are required to be ready for immediate use in an adhesive joint in a high volume production environment where it may not be possible to apply a liquid product on line. When cured, this product will also act as a thread sealant.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Flash Point - See MSDS

Viscosity @ 25°C, mPa·s (cP):

Haake cone & plate:

PK100 @ 36 S⁻¹

pH @ °C

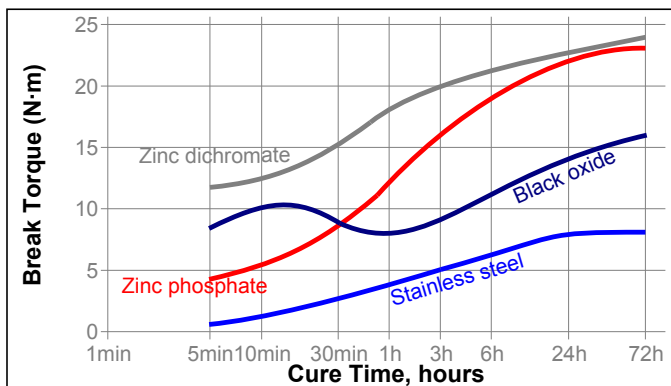
1,600 to 4,000^{LMS}

7.5 to 11.0^{LMS}

TYPICAL CURING PERFORMANCE

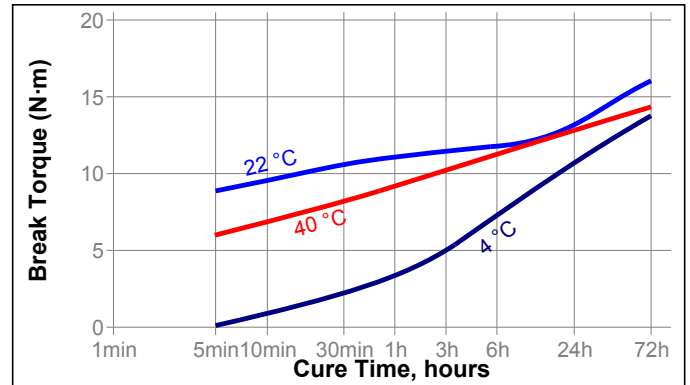
Cure Speed vs. Substrate

This product has a similar cure profile for various metal substrates. The graph below shows the breakaway strength developed with time on M10 X 1.5 black oxide bolts and steel nuts compared to different materials and tested according to ISO 10964.



Cure Speed vs. Temperature

The rate of cure will depend on the ambient temperature. The graph below shows the breakaway strength developed with time at different temperatures on M10 X 1.5 black oxide bolts and steel nuts and tested according to ISO 10964.



TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties

Coefficient of Thermal Expansion, ISO 11359-2, K ⁻¹	10×10 ⁻⁴
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

After 24 hours @ 22 °C

Breakaway Torque, ISO 10964:

M10 X 1.5 steel bolts	N·m	≥12 ^{LMS}
	(lb.in.)	(106.2)

Prevail Torque, ISO 10964:

M10 X 1.5 steel bolts	N·m	≥17 ^{LMS}
	(lb.in.)	(150.4)

Breakloose Torque, DIN 267-27:

M10 X 1.5 steel bolts	N·m	27
	(lb.in.)	(238)

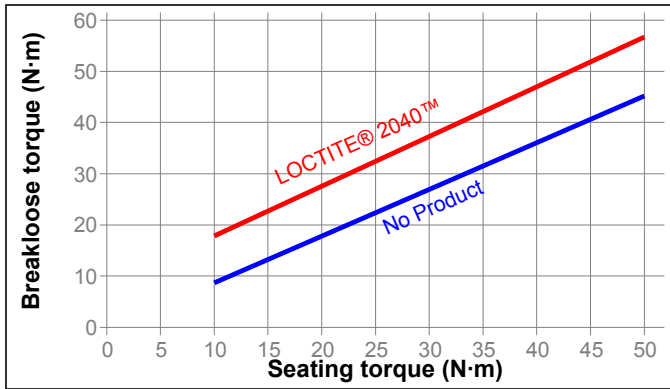
Lubricity, K-Factor:

M10 X 1.5 black oxide bolts	0.29
M10 X 1.5 zinc dichromate bolts	0.3

Torque Augmentation

Breakloose torque of an uncoated fastener will normally be 15 to 30% less than the on-torque. The effect of LOCTITE® 2040™ on the breakloose torque is shown in the graph below.





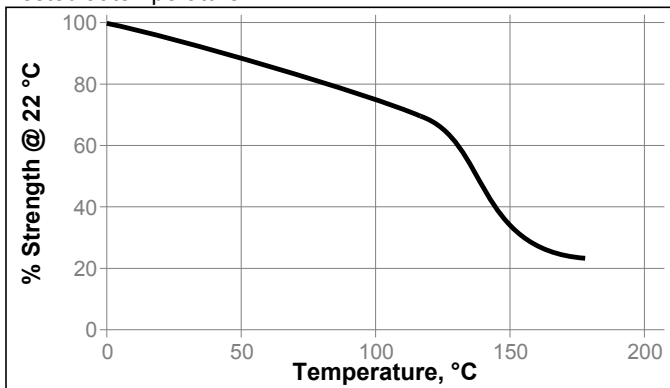
TYPICAL ENVIRONMENTAL RESISTANCE

After 72 hours @ 22 °C

Breakaway Torque, ISO 10964:
M10 X 1.5 steel bolts

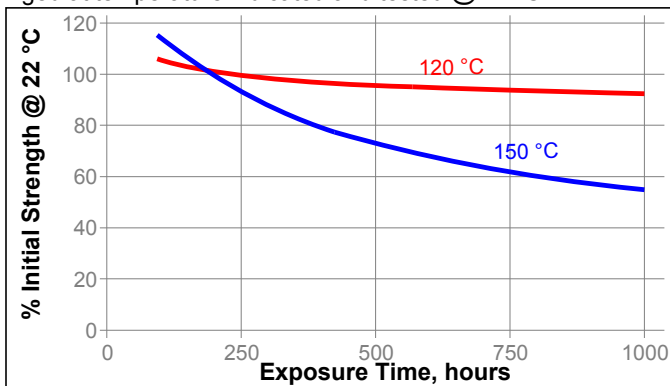
Hot Strength

Tested at temperature



Heat Aging

Aged at temperature indicated and tested @ 22 °C



Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 22°C.

Breakaway Torque, DIN 267-27:

M10 X 1.5 black oxide bolts and steel
nuts

Environment	°C	% of initial strength		
		100 h	500 h	1000 h
Motor oil (MIL-L-46152)	120	70	70	45
Motor oil (MIL-L-46152)	150	55	50	40
Unleaded gasoline	22	85	80	40
Brake fluid	90	85	80	40
Water/glycol 50/50	120	90	70	40
Transmission fluid	120	70	70	40
Transmission fluid	150	65	55	35
Gear oil	120	75	70	55

Note: This product meets the requirements of DIN 267-27 on seated and unseated grade 8.8 M10 mild steel, zinc dichromate and zinc phosphate bolts. LOCTITE® 2040™ performs close to or surpasses the environmental resistance requirements of DIN 267-27

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).

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. This coating is produced from an aqueous two component system consisting of a liquid binder and microencapsulated chemical initiators. The components are coated onto threads at approved Loctite® coating centers. Details are available from your local Technical Service Center.
2. The coated fastener is ready for immediate use and can be assembled to its mating threaded component at any time within its on-part shelf life period.
3. For best performance bond surfaces should be clean and free from grease.
4. Product is normally pre-applied to the bolt in sufficient quantity to fill all engaged threads. Very large thread sizes may create gaps which will affect performance.
5. After assembly and cure a fastener coated with LOCTITE® 2040™ should not be re-used if the joint is disassembled. In the case of disassembly a fastener coated with LOCTITE® 2040™ or a liquid threadlocker of similar performance should be used.

Loctite Material Specification^{LMS}

LMS dated March 28, 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

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Reference 0.1