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Technical Data Sheet

LOCTITE® DRI 2045™

Known as LOCTITE® Dri-Loc 2045™
August 2016

PRODUCT DESCRIPTION

LOCTITE® DRI 2045™ provides the following product characteristics:

Technology	Acrylic
Chemical Type	Methacrylate ester
Components	Two-component
Component Combinations	Part A + Part B Part C + Part B
Appearance - Part A	Red, homogeneous, viscous liquid[LMS]
Appearance - Part C	Creamy-white, homogeneous, viscous liquid[LMS]
Appearance - Part B	Yellow, homogeneous, viscous liquid[LMS]
Viscosity	Low
Cure	Anaerobic
Application	Threadlocking

LOCTITE® DRI 2045™ is a medium to high strength pre-applied threadlocker with good substrate compatibility specially designed to meet automotive specification requirements. It is suitable for use on plain and passivated metal surfaces. This product has good hot strength and heat aging capabilities up to 220°C as well as good solvent resistance properties. 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® DRI 2045™ prevents loosening of threaded fasteners. When cured, this product will also act as a thread sealant. 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.

LOCTITE® DRI 2045™ is a two component product. Either Part A or Part C can be used with Part B, depending on local availability. When using the first combination (Part A + Part B), the resultant coating is red in color. Alternatively, when using the other possible combination (Part C + Part B), the color of the coating will be pale yellow unless a color pigment is added. Various color pigments are available to achieve desired colors.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Part A and Part C:

Flash Point - See SDS	
Viscosity @ 25°C, mPa·s (cP):	
Haake PK100 @ 36 S^{-1}	600 to 3,000[LMS]
pH	9 to 11

Part B:

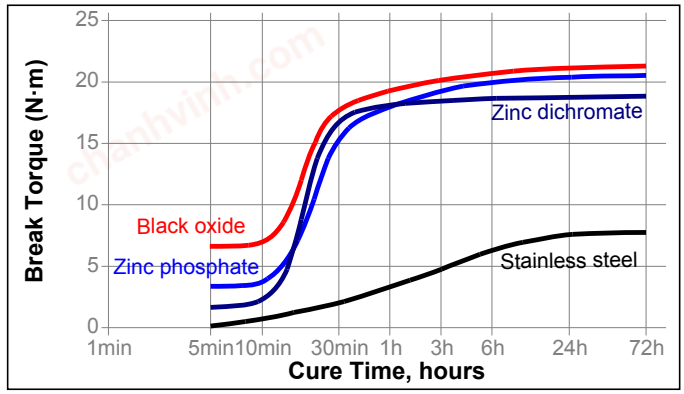
Flash Point - See SDS	
Viscosity @ 25°C, mPa·s (cP):	
Haake PK100 @ 36 S^{-1}	3,000 to 5,000

TYPICAL CURING PERFORMANCE

On Part Life, years	4

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 at room temperature according to ISO 10964.



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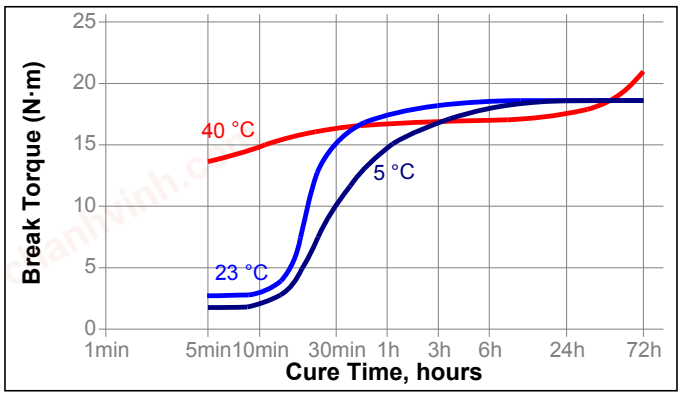
Cure Speed vs. Temperature
The rate of cure will depend on the ambient temperature. The graph below shows the breakaway strength developed with time at different temperatures on M10 X 1.5 black oxide bolts and steel nuts and tested according to ISO 10964.



TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

After 24 hours @ 22 °C

Breakaway Torque, ISO 10964:

M10 X 1.5 steel bolts	N·m (lb.in.)	≥10[LMS] (≥88.5)

Prevail Torque, ISO 10964:

M10 X 1.5 steel bolts	N·m (lb.in.)	≥5[LMS] (≥44.2)

After 24 hours @ 22 °C followed by 5 hours @ 160 °C, tested @ 160 °C

Breakaway Torque, ISO 10964:

M10 X 1.5 steel bolts	N·m (lb.in.)	≥10[LMS] (≥88.5)

After 72 hours @ 22 °C

Breakaway Torque, ISO 10964:

M10 x 1.5 Steel with Anti-Rust grade 10.9 bolts and grade 8 steel zinc plated nuts	N·m (lb.in.)	15 (130)
M10 x 1.5 Steel Zinc plated grade 10.9 bolts and grade 10 steel zinc plated nuts	N·m (lb.in.)	15 (130)
M10 x 1.5 Steel Magni 554 plated grade 8.8 bolts and grade 8 steel zinc plated nuts	N·m (lb.in.)	25 (220)

Prevail Torque, ISO 10964:

M10 x 1.5 Steel with Anti-Rust grade 10.9 bolts and grade 8 steel zinc plated nuts	N·m (lb.in.)	13 (115)
M10 x 1.5 Steel Zinc plated grade 10.9 bolts and grade 10 steel zinc plated nuts	N·m (lb.in.)	10 (92)
M10 x 1.5 Steel Magni 554 plated grade 8.8 bolts and grade 8 steel zinc plated nuts	N·m (lb.in.)	15 (130)

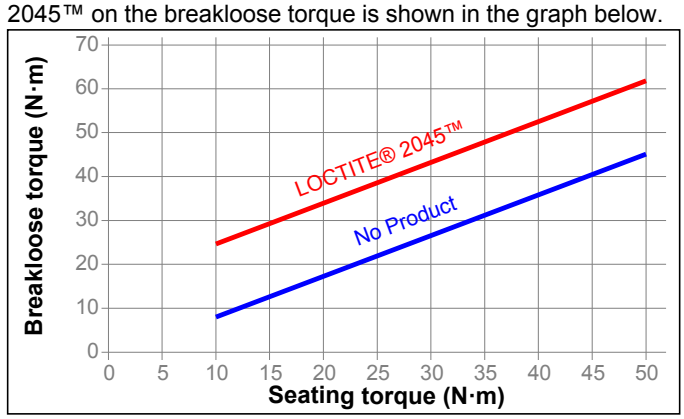
Breakloose Torque, ISO 10964, Input Torque = 50 N·m:

M10 x 1.5 Steel with Anti-Rust grade 10.9 bolts and grade 8 steel zinc plated nuts	N·m (lb.in.)	52 (465)
M10 x 1.5 Steel Zinc plated grade 10.9 bolts and grade 10 steel zinc plated nuts	N·m (lb.in.)	54 (480)
M10 x 1.5 Steel Magni 554 plated grade 8.8 bolts and grade 8 steel zinc plated nuts	N·m (lb.in.)	50 (440)

Total Coefficient of Friction (DIN 946):
These values are only valid for tested combinations of fasteners. Friction coefficients are based on :
- Surface finish
- Surface roughness
- Fitting quality of bearing surface
- Lubrication
- Assembly conditions (e.g. screw-in speed)
- Design (e.g. dimensions, geometry of threads)

M10 x 1.5 Steel with Anti-Rust grade 10.9 bolts and grade 8 steel zinc plated nuts	0.18
M10 x 1.5 Steel Zinc plated grade 10.9 bolts and grade 10 steel zinc plated nuts	0.18
M10 x 1.5 Steel Magni 554 plated grade 8.8 bolts and grade 8 steel zinc plated nuts	0.13

Torque Augmentation
Breakloose torque of an uncoated fastener will normally be 15 to 30% less than the on-torque. The effect of LOCTITE® DRI 2045™ on the breakloose torque is shown in the graph below.



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TYPICAL ENVIRONMENTAL RESISTANCE

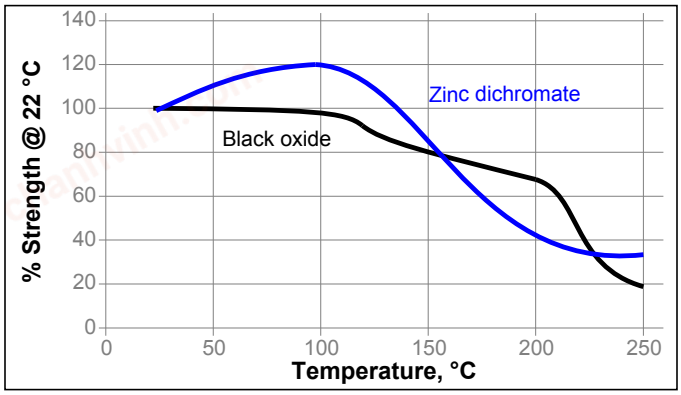
After 24 hours @ 22 °C

Breakaway Torque, ISO 10964:

M10 X 1.5 steel bolts (unseated)

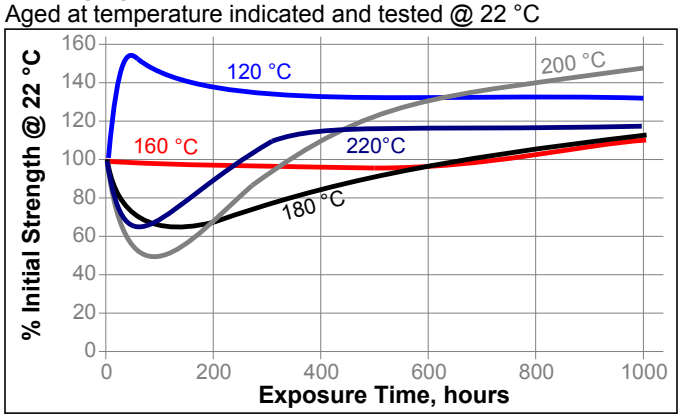
Hot Strength

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 black oxide bolts and steel nuts (unseated)

		% of initial strength		
Environment	**°C**	**168 h**	**500 h**	**1000 h**
Motor oil	120	100	100	95
Motor oil	150	50	50	50
Unleaded gasoline	22	85	85	85
Brake fluid	90	125	125	125
Water/glycol 50/50	120	100	100	100
Transmission fluid	120	100	100	95
Transmission fluid	150	65	70	70
Gear oil	120	100	65	65
DEF (AdBlue®)	22	90	110	85

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® DRI 2045™ 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 Safety Data Sheet (SDS).

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. LOCTITE® DRI 2045™ is applied to threaded parts by authorized process centers who have automatic fastener cleaning, feeding, coating, rust proofing and drying equipment. Quantities can be handled promptly with minimum turnaround time. Sample fittings should be sent to the nearest authorized process center where they will coat your parts and return them to you for evaluation. SAMPLE TESTS ARE RECOMMENDED TO OBTAIN DESIRED RESULTS ON YOUR PARTS. Contact the nearest Loctite Sales Representative for the authorized process center nearest to you..

Loctite Material Specification[LMS]

LMS dated October 15, 2001 (Part A), LMS dated October 15, 2001 (Part B) and LMS dated August20, 2003 (Part C). 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 Loctite 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.

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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

Reference N/A

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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