Technical Data Sheet

LOCTITE® 243™

(TDS for new formulation of Loctite® 243™) March 2010

PRODUCT DESCRIPTION

LOCTITE® 243™ provides the following product characteristics:

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

This Technical Data Sheet is valid for LOCTITE® 243™ manufactured from the dates outlined in the "Manufacturing Date Reference" section.

LOCTITE® 243™ is designed for the locking and sealing of threaded fasteners which require normal disassembly with standard hand tools. The product cures when confined in the absence of air between close fitting metal surfaces and prevents loosening and leakage from shock and vibration. The thixotropic nature of LOCTITE® 243™ reduces the migration of liquid product after application to the substrate. LOCTITE® 243™ 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.

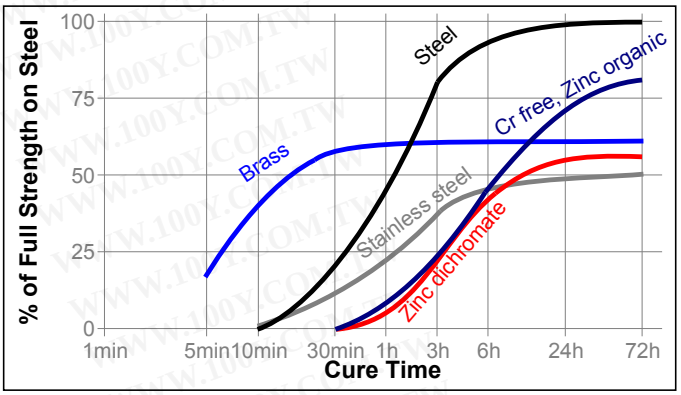
TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.08
Flash Point - See MSDS	
Viscosity, Brookfield - RVT, 25 °C, mPa·s (cP):	
Spindle 3, speed 20 rpm	1,300 to 3,000[LMS]
Viscosity, Cone & Plate, 25 °C, mPa·s (cP):	
Cone 35/2°Ti @ shear rate 129 s^{-1}	350

TYPICAL CURING PERFORMANCE

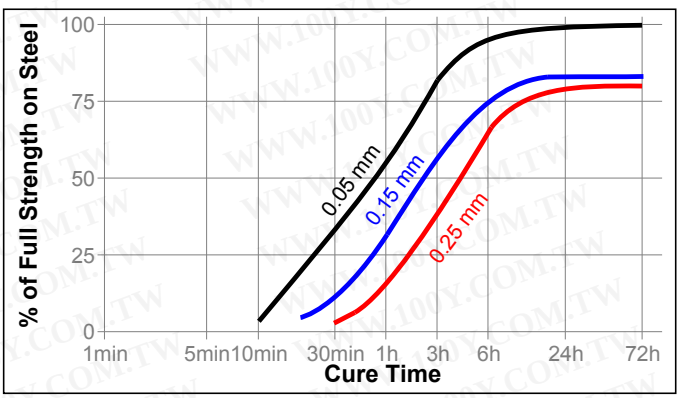
Cure Speed vs. Substrate

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.



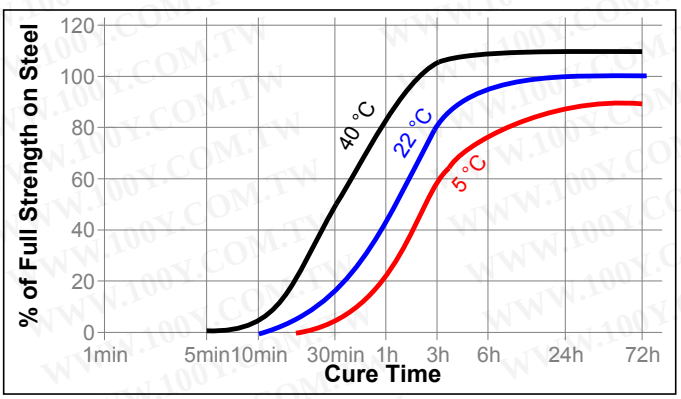
Cure Speed vs. Bond Gap

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.

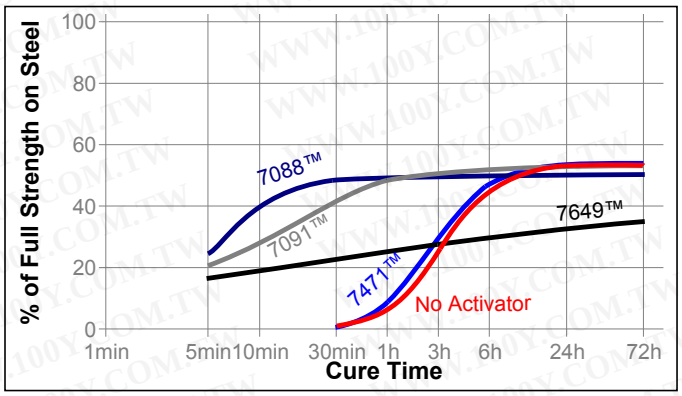


Cure Speed vs. Temperature

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	26
	(lb.in.)	(230)
M6 steel nuts and bolts	N·m	3
	(lb.in.)	(26)
M16 steel nuts and bolts	N·m	44
	(lb.in.)	(390)
3/8 x 16 steel nuts and bolts	N·m	12
	(lb.in.)	(106)

Prevail Torque @ 180°, ISO 10964, Unseated:

M10 steel nuts and bolts	N·m	5
	(lb.in.)	(40)
M6 steel nuts and bolts	N·m	1
	(lb.in.)	(8)
M16 steel nuts and bolts	N·m	13
	(lb.in.)	(115)
3/8 x 16 steel nuts and bolts	N·m	3
	(lb.in.)	(26)

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

M10 steel nuts and bolts	N·m	24
	(lb.in.)	(210)
3/8 x 16 steel nuts and bolts	N·m	15
	(lb.in.)	(130)

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

M10 steel nuts and bolts	N·m	4
	(lb.in.)	(35)
3/8 x 16 steel nuts and bolts	N·m	3.5
	(lb.in.)	(30)

Compressive Shear Strength, ISO 10123:

Steel pins and collars	N/mm²	≥7.6[LMS]
	(psi)	(≥1,100)

Cured for 1 week @ 22 °C

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

M10 zinc phosphate nuts and bolts	N·m	26
	(lb.in.)	(230)
M10 stainless steel nuts and bolts	N·m	17
	(lb.in.)	(150)

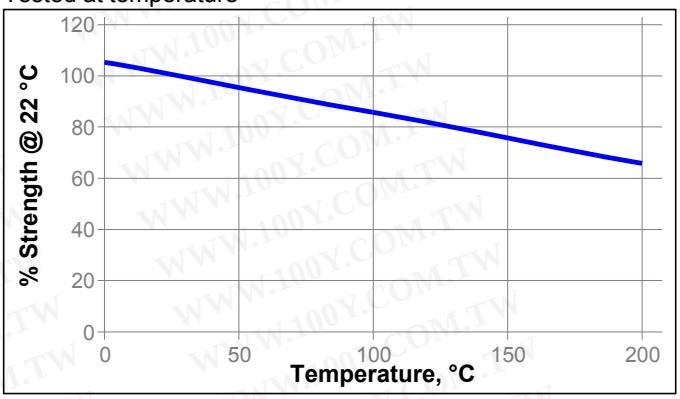
TYPICAL ENVIRONMENTAL RESISTANCE

Cured for 1 week @ 22 °C

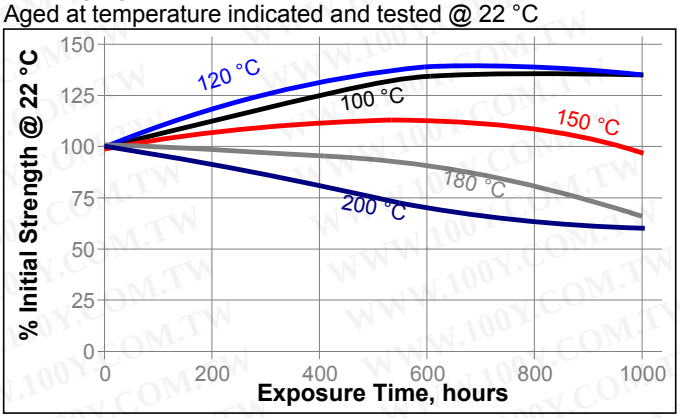
Breakloose Torque, ISO 10964, Pre-torqued to 5 N·m:

M10 zinc phosphate steel nuts and bolts

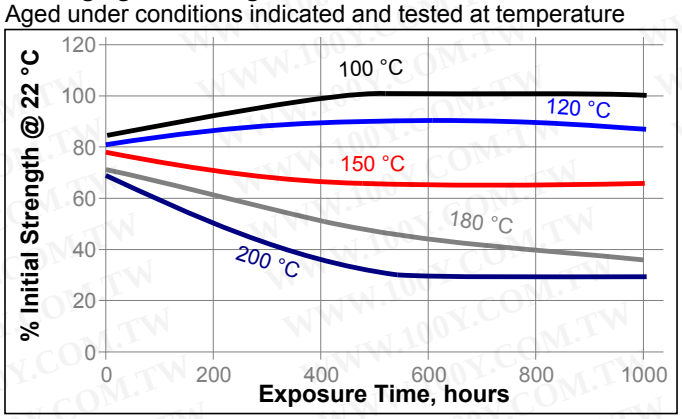
Hot Strength
Tested at temperature



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**
Motor oil	125	110	115
Unleaded gasoline	22	100	95
Brake fluid	22	105	110
Water/glycol 50/50	87	120	125
Acetone	22	85	85
Ethanol	22	95	90
E85 Ethanol fuel	22	95	100
B100 Bio-Diesel	22	110	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**
Sodium Hydroxide, 20%	22	105	105
Phosphoric Acid, 10%	22	110	105

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:

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. Shake the product thoroughly before use.
4. To prevent the product from clogging in the nozzle, do not allow the tip to touch metal surfaces during application.
5. **For Thru Holes**, apply several drops of the product onto the bolt at the nut engagement area.
6. **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.
7. **For Sealing Applications**, apply a 360° bead of product to the leading threads of the male fitting, leaving the first thread free. Force the material into the threads to thouroughly fill the voids. For bigger threads and voids, adjust product amount accordingly and apply a 360° bead of product on the female threads also.
8. 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 29, 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

Manufacturing Date Reference

This Technical Data Sheet is valid for LOCTITE® 243™ manufactured from the dates below:

Made in:	**First manufacturing date**:
EU	July 2009
Brazil	July 2010
China	August 2009
India	August 2009
U.S.A.	December 2009

The manufacturing date can be determined from the batch code on the pack. For assistance please contact your local Technical Service Center or Customer Service Representative.

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

Trademark usage

Except as otherwise noted, all trademarks in this document are trademarks of Henkel Corporation in the U.S. and elsewhere. ® denotes a trademark registered in the U.S. Patent and Trademark Office.

Reference 0.1

技术数据表

LOCTITE® 243™

(TDS for new formulation of Loctite® 243™)3月 2012

产品描述:

LOCTITE® 243™具有以下产品特性:

技术	丙烯酸
化学类型	甲基丙烯酸酯
外观（未固化）	蓝色液体LMS
荧光性	具有荧光性LMS
组成	单组分-不需混合
粘度	中等粘度，触变性
固化方式	厌氧
二次固化	促进剂
应用	螺纹锁固
强度	中强度

本技术数据表适用于“生产日期参考”部分提及的日期后生产的 LOCTITE® 243™ 。

LOCTITE® 243™ 适合于锁固和密封需要正常拆卸的螺纹紧固件，使用标准手工工具可正常拆卸该产品在两个紧密配合的金属表面间，与空气隔绝时固化，并且可防止由于受到冲击和震动而导致的松动和泄露。LOCTITE®5182 ®的触变特性降低了液态产品在 胶到基材上后，未固化前的流淌性LOCTITE® 243™ 固化性能很好，不仅在作用于活性金属（诸如黄铜、紫铜），同时作用于惰性基材，诸如不锈钢和镀层表面此产品耐高温抗油脂。它能容许各种轻微表面污染，诸如切割、润滑、防腐蚀和保护液体内所含的油污的

NSF 国际认可

NSF P1注 认可 可在不和食物及周围食品加工领域接触的地方作为密封剂使用。**注意：** 这是一个区域性认可。如需更多资料和说明请与当地的技术服务中心联系。

NSF 国际认证

符合ANSI/NSF标准61认可：可用于不超过82° C的商业和住宅饮用水系统。 **注意：** 这是一个区域性认可。如需更多资料和说明请与当地的技术服务中心联系。

固化前的材料特性

比重@ 25 ° C 1,08

闪点 - 见 MSDS

粘度， Brookfield - RVT， 25 ° C，mPa.s (cp)：

转子 3#， 转速 20 rpm 1 300至3 000LMS

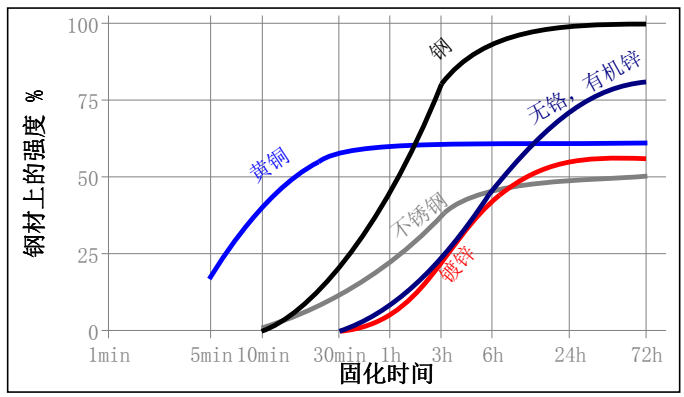
粘度，锥板粘度计，25 ° C，mPa.s (cp)：

Cone 35/2° Ti @ shear rate 129 s^{-1} 350

典型固化特性

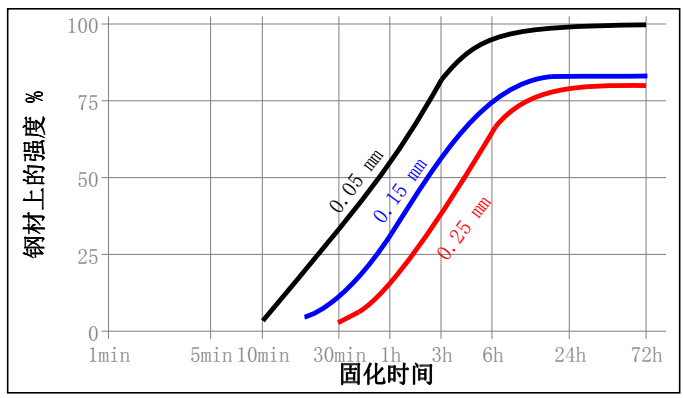
固化速度与基材的关系

固化速度取决于所用的基材下图显示在不同材质的M10的螺栓和螺母上，破坏扭矩与时间的关系。测试标准为ISO 10964 标准.



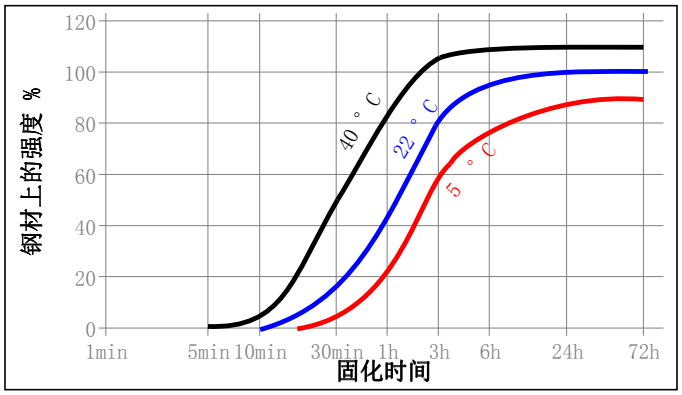
固化速度与粘接间隙的关系

固化速度取决于间隙的大小螺纹紧固件的间隙与螺纹的类型、质量和尺寸有关下图显示的是在钢制轴和套上，不同螺纹间隙的钢制轴和套，压剪切强度和固化时间的关系。测试标准为ISO 10123方法测试



固化速度与温度的关系

固化速度取决于温度下图显示在M10的螺栓和螺母上，在不同温度下破坏扭矩与时间的关系。测试标准为ISO 10964 标准



固化速度与促进剂的关系

当固化速度很慢或者间隙较大时，可在表面使用促进剂加快固化速度下图显示在M10　重铬酸锌钢制螺栓和螺母上，使用促进剂　7471™，　7649™，　7088™ 以及7091™，其破坏扭矩和时间的关系。测试标准 ISO 10964 标准

固化后材料特性

胶粘剂性能

22° C固化1周
破坏力矩， ISO 10964,无上紧扭矩:

M10　钢制螺栓和螺母	N • m		26
	(lb. in.)	(230)	
M6钢制螺母螺栓	N • m		3
	(lb. in.)	(26)	
M16　钢制螺母螺栓	N • m		44
	(lb. in.)	(390)	
3/8 x　16 钢质螺母与螺栓	N • m		12
	(lb. in.)	(106)	

平均拆卸扭矩@ 180° ， ISO 10964,无上紧扭矩:

M10　钢制螺栓和螺母	N • m		5
	(lb. in.)	(40)	
M6钢制螺母螺栓	N • m		1
	(lb. in.)	(8)	
M16　钢制螺母螺栓	N • m		
	13(lb. in.)	(115)	
3/8 x　16 钢质螺母与螺栓	N • m		3
	(lb. in.)	(26)	

松脱力矩， ISO 10964， 预紧扭矩 to　5 N • m:

M10　钢制螺栓和螺母	N • m		
	24(lb. in.)	(210)	
3/8 x　16 钢质螺母与螺栓	N • m		
	15(lb. in.)	(130)	

平均拆卸扭矩@ 180° ， ISO 10964， 预紧扭矩 to　5 N • m:

M10　钢制螺栓和螺母	N • m		4
	(lb. in.)	(35)	
3/8 x　16 钢质螺母与螺栓	N • m		
	3,5(lb. in.)	(30)	

压剪切强度，　ISO 10123:

钢制轴和套	N/mm²	
	≥7,6[LMS]	
	(psi)	(≥1
	100)	

25° C下固化14天
松脱力矩， ISO 10964， 预紧扭矩 to　5 N • m:

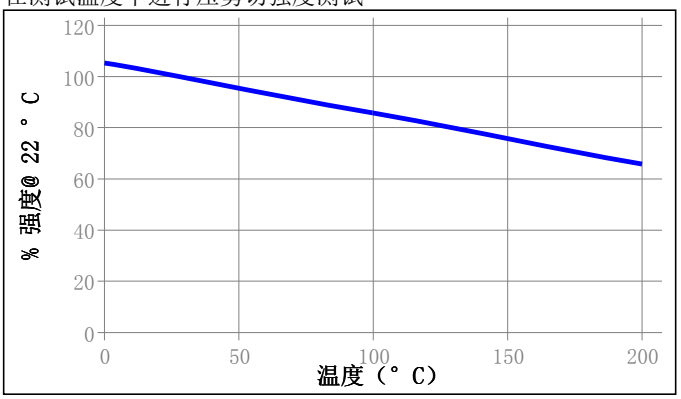
M10　磷酸锌制螺母螺栓	N • m		
	26(lb. in.)	(230)	
M10　不锈钢制螺母螺栓	N • m		
	17(lb. in.)	(150)	

典型耐环境抗性

22° C固化1周
松脱力矩， ISO 10964， 预紧扭矩 to　5 N • m:
M10　镀锌螺栓和螺母上测量

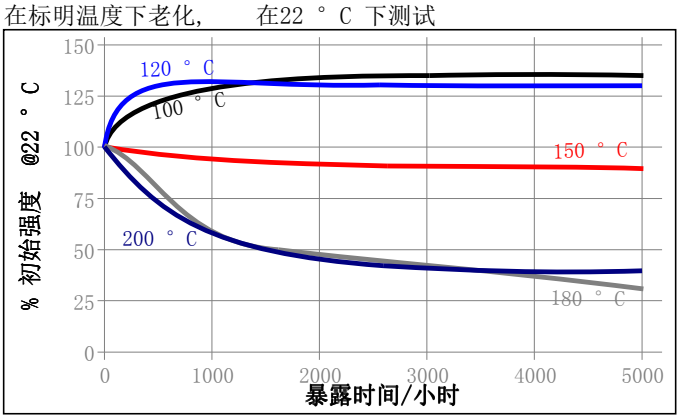
热强度

在测试温度下进行压剪切强度测试

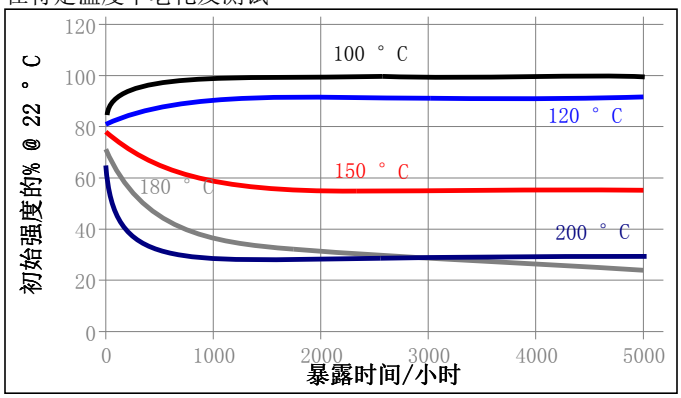


热老化强度

在标明温度下老化，　在22 ° C 下测试



热老化/热强度
在特定温度下老化及测试



耐化学品/溶剂测试
在下列条件下进行老化，然后在22 ° C下测试.

		初始强度的保持率%		
环境	**° C**	**500 h**	**1000 h**	**5000 h**
机油	125	110	115	115
无铅汽油	22	100	95	100
制动液	22	105	110	125
乙二醇/水（50/50）	87	120	125	130
丙酮	22	85	85	80
乙醇	22	95	90	90
E85 乙醇燃料	22	95	100	95
B100 生物柴油	22	110	110	125
DEF (AdBlue®)	22	61	59	70

松脱力矩, ISO 10964, 预紧扭矩 to 5 N•m:
M10不锈钢制螺母螺栓

		初始强度的保持率%		
环境	**° C**	**500 h**	**1000 h**	**5000 h**
氢氧化钠， 20%	22	105	105	95
磷酸, 10%	22	110	105	110

注意事项
本产品不宜在纯氧/或富氧环境中使用，不能作为氯气或其它强氧化性物质的密封材料使用
有关本产品的安全注意事项，请查阅乐泰的材料安全数据资料(MSDS).
使用前用水性清洗剂清洗材料表面时，应检查该清洗剂与本产品的兼容性。在某些情况下，使用的清洗剂可能会影响本产品的固化和性能。
该产品不推荐使用在塑料上(尤其是热塑性塑料，可能会引起应力开裂)，在应用之前建议首先测试产品与材质的相容性。

使用指南

装配
1. 为了获得最佳效果，使用诸如乐泰清洗剂彻底清洗材料内外表面，待表面干燥后再进行下一步操作
2. 如果固化速度过慢，使用适合的促进剂。请参考固化速度和催化剂的图例做参考。请待促进剂干燥后再进行下一步操作
3. 使用前充分摇匀本品
4. 为防止产品阻塞管口，使用时请勿令点胶嘴碰触金属表面
5. **对于 孔**,在螺栓和螺母啮合部位点胶
6. **用于盲孔时，滴数滴产品于盲孔内螺纹的下三道以下处，或 用产品于盲孔底部**
7. **对于密封应用，**将产品涂在外螺纹上（360° ）第一个螺牙不涂，将胶粘剂填满整个的螺纹间隙。对于更大的螺纹和间隙，可以调整涂胶量并且也将产品应用在内螺纹上
8. 按正常操作装配螺栓。上紧到所需力矩

拆卸
1. 用标准手动工具拆卸
2. 在极少情况下，由于螺栓长度很长，手动工具无法拆卸，可以局部加热螺栓和螺母到250° C，趁热进行拆卸
3. 对装配局部加热至约250° C，趁热卸载

清洗
1. 对于固化的胶水，可将其浸泡在溶剂中或使用钢刷等工具进行机械打磨

乐泰材料规格LMS
2013年7月11日。每一批号产品的测试报告都标明产品的特性。LMS测试报告中含有一些供客户使用参考的质检测试参数。此外，我们也 过多种质量控制，确保产品质量的一致性。特殊客户的要求可以由汉高乐泰质量中心负责协调。

贮存
产品贮存于未开封的原包装内存放在阴凉干燥处。贮存方法在产品外包装上有所标注。.
理想贮存条件：8 ° C 到 21 ° C。如将该产品 贮存在低于8 ° C 或高于28 ° C情况下，产品性质会受到不良影响 被取出包装盒外使用的产品有可能在使用中受到污染。为避免污染未用产品，不要将任何胶液倒回原包装内。本公司将不会对已受到污染的或上面已提及的贮存方法不恰当的产品负责。如需更多信息，请与当地的乐泰公司技术服务部或客户服务部联系

单位换算
(° 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

生产日期参考
本技术数据表适用于生产于以下日期的LOCTITE® 243™ ：

产地:	**生产日期**
:	
欧洲	2009年7月
巴西	2010年7月
中国	2009年4月
印度	2009年4月

美国 2009年10月

生产日期见包装上的批次编码。如需协调，请联系当地技术服务中心或客户服务代表。

免责声明

注：
本技术数据表 （本表） 所示之信息， 包括对产品使用及应用的建议， 均基于我司在制作本表之时所掌握的与产品相关的知识及经验而获得。 产品可能有多种用途、 并因用途变化及不受我司掌控的贵司操作条件的变化而变化。 因此， 汉高对产品是否适用于贵司使用的生产流程及生产条件、 预期用途及结果不承担责任。我司强烈建议贵司在生产产品前进行测试以确定该产品的适用性。

非经另行明示约定，我司对与本表中的信息以及其他与所涉产品相关的口头或书面建议不承担责任，因我司过失导致的人身伤亡责任及应适用的产品责任法中强制性规则所规定的责任不在此列。

若该产品由Henkel Belgium NV, Henkel Electronic Materials NV, Henkel Nederland BV, Henkel Technologies France SAS and Henkel France SA 提供，则提请另行注意如下事项：
若汉高被裁定应承担责任，无论基于何种法律依据，汉高承担的责任均不超过该批交付产品本身的价值。

若该产品由Henkel Colombiana, S.A.S提供，以下免责应予适用：
本技术数据表（本表）所示之信息，包括对产品使用及应用的建议，均基于我司在制作本表之时所掌握的与产品相关的知识及经验而获得。汉高对产品是否适用于贵司使用的生产流程及生产条件、预期用途及结果不承担责任。我司强烈建议贵司在生产产品前进行测试以确定该产品的适用性。
非经另行明示约定，我司对与本表中的信息以及其他与所涉产品相关的口头或书面建议不承担责任，但因我司过失导致的人身伤亡责任及应适用的强制性产品责任法所规定的责任不在此列。

若该产品由Henkel Corporation, Resin Technology Group, Inc., or Henkel Canada, Inc.提供，以下免责应予适用：
本文中所含的各种数据仅供参考，并被认为是可靠的。对于任何人采用我们无法控制的方法得到的结果，我们恕不负责。自行决定把本产品用在本文中提及的生产方法上，及采取本文中提及的措 来防止产品在贮存和使用过程中可能发生的损失和人身伤害都是用户自己的责任。鉴于汉高公司明确声明对所有因销售汉高产品或特定场合下使用汉高产品而出现的所有问题，包括针对某一特殊用途的可商品化和适用性的问题，不承担责任。汉高公司明确声明对任何必然的或意外损失包括利润方面的损失都不承担责任。本文中所论述的各种生产工艺或化学成分都不能被理解为这些专利可以被其他人随便使用和拥有或被理解为得到了包括这些生产工艺和化学成分的汉高公司的专利许可证。建议用户每次在正式使用前都要根据本文提供的数据先做实验。本产品受美国、外国专利或专利应用的保护。

商标使用
除非另外说明，本文件中所有的商标均为汉高公司在美国或其它地方专利和商标管理部门的注 商标。

参考 0.4