勝 特 力 材 料 886-3-5753170
胜特力电子(上海) 86-21-34970699
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Technical Data Sheet

LOCTITE® 222

January 2009

PRODUCT DESCRIPTION

LOCTITE® 222 provides the following product characteristics:

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

LOCTITE® 222 is designed for the locking and sealing of threaded fasteners which require easy 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. Particularly suitable for applications such as adjustment of set screws, small diameter or long engagement length fasteners, where easy disassembly is required without shearing the screw. The thixotropic nature of LOCTITE® 222 reduces the migration of liquid product after application to the substrate.

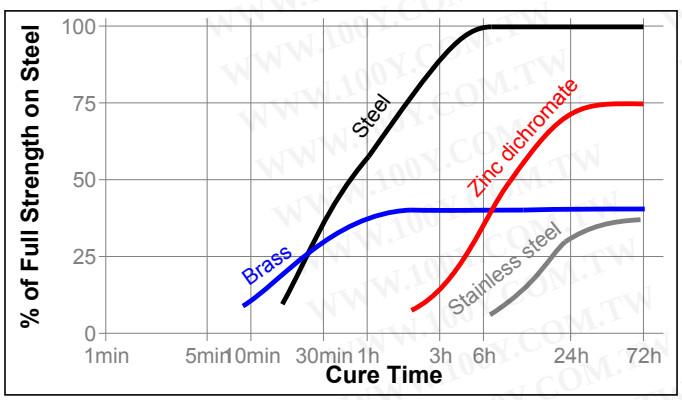
TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.05
Flash Point - See MSDS	
Viscosity, Brookfield - RVT, 25 °C, mPa·s (cP):	
Spindle 3, speed 2.5 rpm	≥3,500
Spindle 3, speed 20 rpm	900 to 1,500[LMS]
Viscosity, EN 12092 - MV, 25 °C, after 180 s, mPa·s (cP):	
Shear rate 277 s^{-1}	135

TYPICAL CURING PERFORMANCE

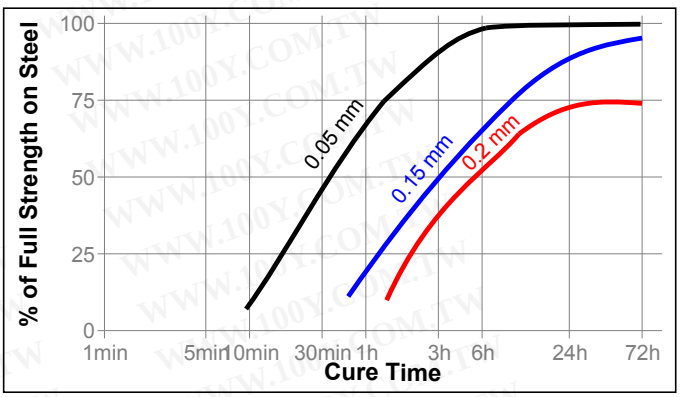
Cure Speed vs. Substrate

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.



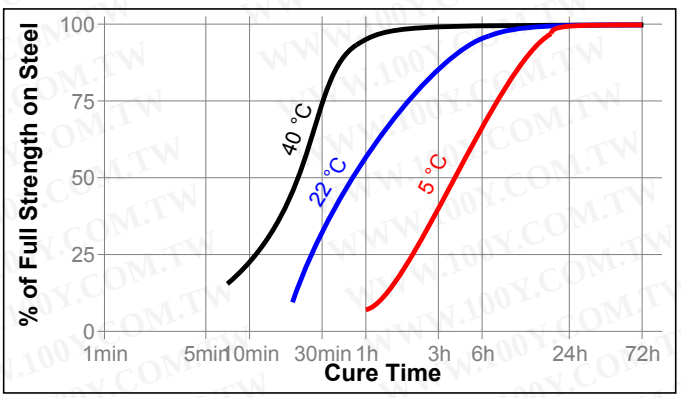
Cure Speed vs. Bond Gap

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.



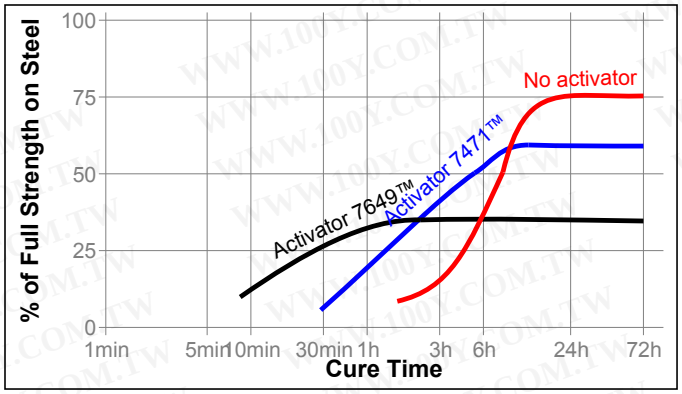
Cure Speed vs. Temperature

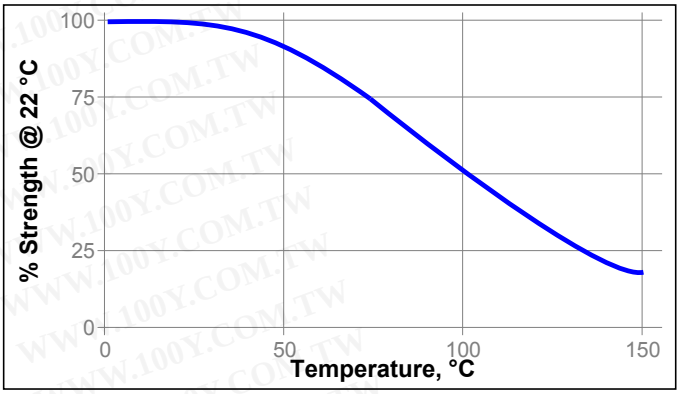
The rate of cure will depend on the temperature. The graph below shows the breakaway strength developed with time at different temperatures on M10 steel nuts and bolts and tested according to ISO 10964.



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™ and 7649™ and tested according to ISO 10964.





TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties:

Coefficient of Thermal Expansion, ISO 11359-2, K^{-1}	80×10^{-6}
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 steel nuts and bolts	N·m	6
	(lb.in.)	(50)

Prevail Torque, ISO 10964:

M10 steel nuts and bolts	N·m	4
	(lb.in.)	(35)

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

M10 steel nuts and bolts	N·m	14
	(lb.in.)	(120)

Max. Prevail Torque, ISO 10964, Pre-torqued to 5 N·m:

M10 steel nuts and bolts	N·m	14
	(lb.in.)	(120)

Compressive Shear Strength, ISO 10123:

Steel pins and collars	N/mm²	≥2.5[LMS]
	(psi)	(≥360)

TYPICAL ENVIRONMENTAL RESISTANCE

Cured for 1 week @ 22 °C

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

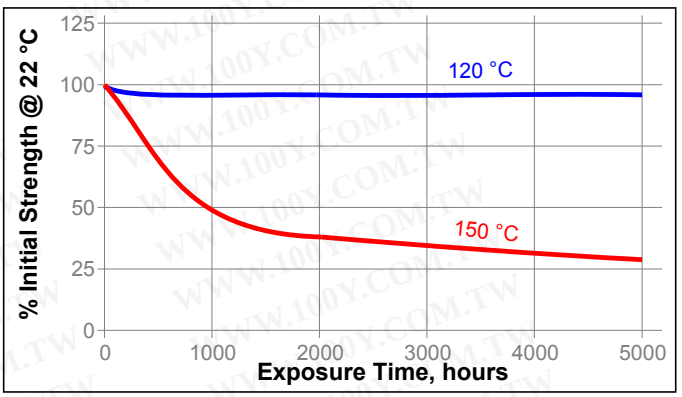
M10 zinc phosphate steel nuts and bolts

Hot Strength

Tested at temperature

Heat Aging

Aged at temperature indicated and tested @ 22 °C



Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 22 °C.

		% of initial strength			
Environment	**°C**	**100 h**	**500 h**	**1000 h**	**5000 h**
Motor oil (MIL-L-46152)	125	100	95	90	85
Leaded Petrol	22	95	95	95	95
Brake fluid	22	95	95	95	90
Water/glycol 50/50	87	80	80	80	80
Acetone	22	100	90	90	90
Ethanol	22	95	95	90	90

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:

Henkel Americas
+860.571.5100

Henkel Europe
+49.89.320800.1800

Henkel Asia Pacific
+86.21.2891.8863

WWW.100Y.COM.TW

For Assembly

1. For best results, clean all surfaces (external and internal) with a LOCTITE® cleaning solvent and allow to dry.
2. If the material is an inactive metal or the cure speed is too slow, spray all threads with and allow to dry.
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 down the internal threads to the bottom of the hole.
7. Assemble and tighten as required.
8. **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.

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.

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 May 18, 1999. 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

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Note

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Trademark usage

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Reference 0.4

LOCTITE® 222

1月 2009

产品说明

LOCTITE® 222 具有下列性能

技术	丙烯酸
化学类型	二甲基丙烯酸乙酯
外观(未固化)	紫色液体LMS
荧光性	具有荧光性LMS
组成	单组分-不需混合
粘度	低粘度,触变性
固化方式	厌
二次固化	促进剂
应用	螺纹锁固
强度	低强度

LOCTITE® 222 适合于锁固和密封需要正常拆卸的螺纹紧固件. 该产品在隔绝 气的金属密封面间固化，可以防止由于震动或冲击而引起的松动或泄漏. 主要用于需要容易拆卸的定位螺丝，小直径螺栓以及配合长度较长的螺栓. 触变特性减少了液态LOCTITE® 222 在施胶后，未固化前到处流淌.

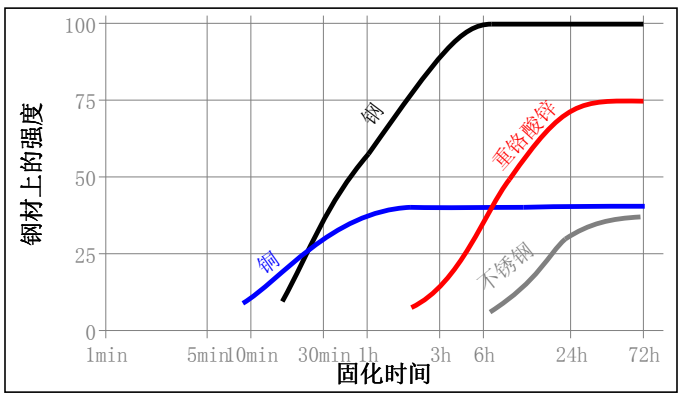
固化前的材料特性

比重@ 25 ° C	1,05
闪点 - 见 MSDS	
粘度, Brookfield - RVT, 25 ° C, mPa • s (cP):	
转子 3, 转速 2,5 rpm	≥3 500
转子 3, 转速 20 rpm	900-1 500LMS
粘度, EN 12092 - MV, 25 ° C, 后180 s, mPa • s (cP):	
剪切速度277 s^{-1}	135

典型固化特性

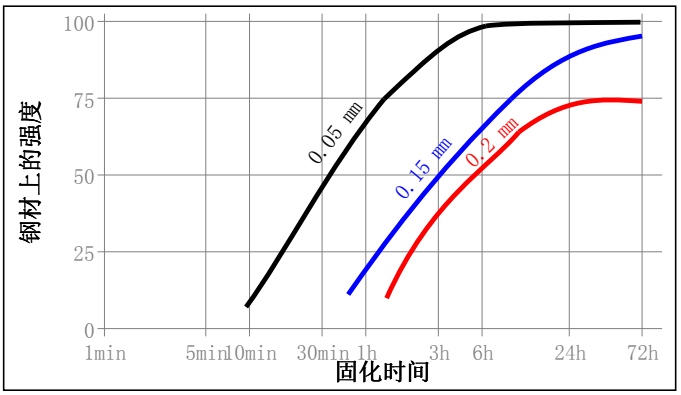
固化速度与基材的关系

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，破坏力矩与时间的关系。测试标准为ISO 10964 标准.



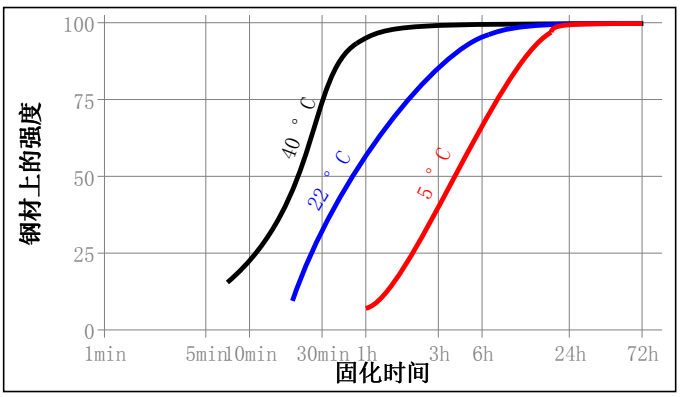
固化速度与间隙的关系

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. 下图显示在钢制轴和套上，在不同的间隙，剪切强度和时间的关系。测试标准为ISO 10123方法测试.



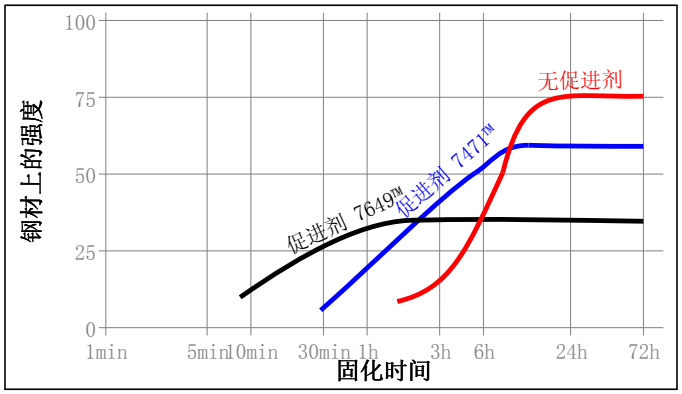
固化速度与温度的关系

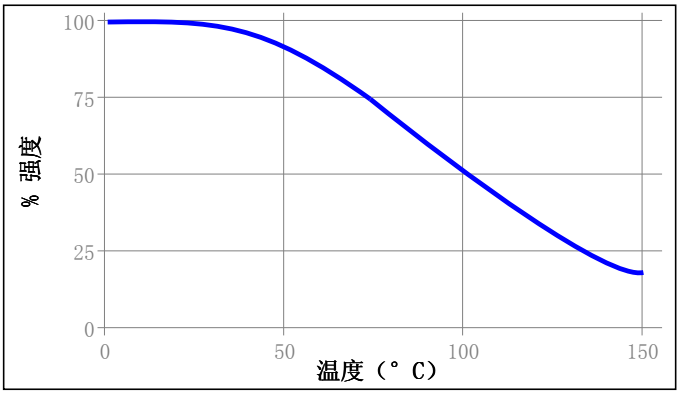
固化速度取决于温度. 下图显示在M10的螺栓和螺母上，在不同温度下破坏力矩与时间的关系。测试标准为ISO 10964 标准.



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，应用促进剂可以加快固化速度. 下图显示在M10 镀锌钢制螺栓和螺母上，使用促进剂7471™ 和 7649™，其破坏力矩和时间的关系。测试标准 ISO 10964 标准.





固化后材料典型性能

物理性能:

热膨胀系数 ISO 11359-2, K^{-1}	80×10^{-6}
导热系数, ISO 8302, W/(m • K)	0,1
比热, kJ/(kg • K)	0,3

固化后材料特性

胶粘剂性能

24小时后 @ 22 ° C

破坏力矩, ISO 10964:		
M10 钢制螺栓和螺母	N • m	6
	(lb. in.)	(50)
平均拆卸力矩, ISO 10964:		
M10 钢制螺栓和螺母	N • m	4
	(lb. in.)	(35)
松脱力矩, ISO 10964, 预紧扭矩 to 5 N • m:		
M10 钢制螺栓和螺母	N • m	14
	(lb. in.)	(120)
最大平均拆卸力矩, ISO 10964, 预紧扭矩 to 5 N • m:		
M10 钢制螺栓和螺母	N • m	14
	(lb. in.)	(120)
压剪切强度, ISO 10123:		
钢制轴和套	N/mm^2	≥2,5[LMS]
	(psi)	(≥360)

典型环境抵抗性能

1周后 @ 22 ° C

松脱力矩, ISO 10964, 预紧扭矩 to 5 N • m:

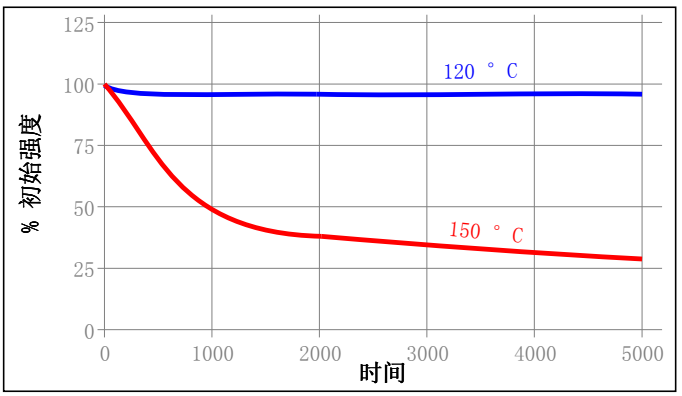
M10 镀锌螺栓和螺母上测量

热强度

在测试温度下进行强度测试

老化强度

在测试温度下进行老化,在22 ° C进行测试



耐化学品/溶剂测试

在下列条件下进行老化，在 22 ° C进行测试.

		初始粘结强度的 有率%			
环境	° C	100 h	500 h	1000 h	5000 h
机油(MIL-L-46152)	125	100	95	90	85
含铅汽油	22	95	95	95	95
制动液	22	95	95	95	90
50/50 乙二醇/水	87	80	80	80	80
丙酮	22	100	90	90	90
乙醇	22	95	95	90	90

注意事项

本产品不宜在纯 与（或）富 环境中使用，不能作为氯气或其它强 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).

当使用清洗剂清洗材料表面时，应检查该清洗剂与胶水的相容性。在某些情况下，使用的清洗剂可能会影响胶水的固化和性能。

该产品不推荐使用在塑料上(尤其是热塑性塑料，可能会引起破裂)，在应用之前建议首先测试产品对材质的相容性。

使用指南

装配

1. 为了获得最佳效果，使用诸如乐泰ODC free清洗剂彻底清洗材料内外表面，并干燥.
2. 如果材质为非活泼金属或未知材料，在配合面喷洒，并晾干30秒钟.
3. 使用前充分摇匀.
4. 为防止胶水阻塞施胶嘴，应避免胶嘴接触金属物质.
5. **对于通孔**,在螺栓和螺母配合部位点胶.
6. **对于盲孔**,在盲孔底部滴胶。当装配时，内部空气会被排出.
7. 按正常操作装配螺栓。当需要上紧到所需力矩时，力矩补偿并不需要.
8. **对于密封应用，** 将产品涂在外螺纹上（360°）第一个螺纹不涂，将胶粘剂添满整个的螺纹间隙。对于更大的螺纹和间隙，可以调整涂胶量并且将也将产品应用在内螺纹上.

拆卸

1. 用标准拆卸工具拆卸.
2. 在极少情况下，由于配合长度很长导致常温下无法拆卸，可以局部加热螺栓和螺母到232°C，趁热进行拆卸.

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.

乐泰材料说明LMS

LMS于5月 18, 1999. 每一批号产品都有测试报告。LMS测试报告中含有一些对客户有用的质检测试参数。此外，我们也通过多种质量控制，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。

贮存条件

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 to 21 ° C。如将该产品 贮存在低于8 ° C 或高于28 ° C条件下，可能会影响产品性能.

被取出包装盒外使用的产品有可能在使用中受到污染。为避免污染未用胶液，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

说明

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施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**汉高乐泰公司明确声明对所有因销售乐泰产品或特定场合下使用乐泰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。汉高乐泰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

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参考 0.4