



Revision Number: 006.0

Issue date: 10/17/2019

**1. PRODUCT AND COMPANY IDENTIFICATION**

<b>Product name:</b>	<b>Loctite 640 Retaining Compound 640</b>	<b>IDH number:</b>	492147
<b>Product type/use:</b>	Anaerobic Adhesive	<b>Item number:</b>	37484
<b>Restriction of Use:</b>	None identified	<b>Region:</b>	United States
<b>Company address:</b>	<b>Contact information:</b>		
Henkel Corporation	Telephone: +1 (860) 571-5100		
One Henkel Way	MEDICAL EMERGENCY Phone: Poison Control Center		
Rocky Hill, Connecticut 06067	1-877-671-4608 (toll free) or 1-303-592-1711		
	TRANSPORT EMERGENCY Phone: CHEMTREC		
	1-800-424-9300 (toll free) or 1-703-527-3887		
	Internet: www.henkelna.com		

**2. HAZARDS IDENTIFICATION**

**EMERGENCY OVERVIEW**

**DANGER:** CAUSES SKIN IRRITATION.  
 MAY CAUSE AN ALLERGIC SKIN REACTION.  
 CAUSES SERIOUS EYE DAMAGE.  
 MAY CAUSE DAMAGE TO ORGANS THROUGH PROLONGED OR REPEATED EXPOSURE.

HAZARD CLASS	HAZARD CATEGORY
SKIN IRRITATION	2
SERIOUS EYE DAMAGE	1
SKIN SENSITIZATION	1
SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE	2

**PICTOGRAM(S)**



**Precautionary Statements**

**Prevention:** Do not breathe vapors, mist, or spray. Wash affected area thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. Wear protective gloves, eye protection, and face protection.

**Response:** IF ON SKIN: Wash with plenty of water. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if you feel unwell. If skin irritation or rash occurs: Get medical attention. Take off contaminated clothing.

**Storage:** Not prescribed

**Disposal:** Dispose of contents and/or container according to Federal, State/Provincial and local governmental regulations.

Classification complies with OSHA Hazard Communication Standard (29 CFR 1910.1200) and is consistent with the provisions of the United Nations Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

See Section 11 for additional toxicological information.

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Component(s)	CAS Number	Percentage*
Methacrylic acid, monoester with 1,2-propanediol, polymer with 4,4'-methylene-diphenyl diisocyanate	190208-19-6	50 - 60
Polyglycol dimethacrylate	109-16-0	20 - 30
Hydroxyalkyl methacrylate	27813-02-1	5 - 10
Acrylic acid	79-10-7	5 - 10
Cumene hydroperoxide	80-15-9	1 - 5
Cumene	98-82-8	0.1 - 1
methacrylic acid	79-41-4	0.1 - 1

\* Exact percentages may vary or are trade secret. Concentration range is provided to assist users in providing appropriate protections.

### 4. FIRST AID MEASURES

<b>Inhalation:</b>	Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
<b>Skin contact:</b>	Immediately flush skin with plenty of water (using soap, if available). Remove contaminated clothing and footwear. Wash clothing before reuse. Get medical attention.
<b>Eye contact:</b>	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.
<b>Ingestion:</b>	DO NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.
<b>Symptoms:</b>	See Section 11.

### 5. FIRE FIGHTING MEASURES

<b>Extinguishing media:</b>	Water spray (fog), foam, dry chemical or carbon dioxide.
<b>Special firefighting procedures:</b>	Wear self-contained breathing apparatus and full protective clothing, such as turn-out gear. In case of fire, keep containers cool with water spray.
<b>Unusual fire or explosion hazards:</b>	Uncontrolled polymerization may occur at high temperatures resulting in explosions or rupture of storage containers.
<b>Hazardous combustion products:</b>	Oxides of carbon. Oxides of sulfur. Oxides of nitrogen. Irritating organic vapours.

### 6. ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.

<b>Environmental precautions:</b>	Do not allow product to enter sewer or waterways.
<b>Clean-up methods:</b>	Remove all sources of ignition. Evacuate and ventilate spill area; dike spill to prevent entry into water system; wear full protective equipment during clean-up. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Scrape up as much material as possible. Store in a partly filled, closed container until disposal. Refer to Section 8 "Exposure Controls / Personal Protection" prior to clean up.

## 7. HANDLING AND STORAGE

**Handling:** Use only with adequate ventilation. Prevent contact with eyes, skin and clothing. Do not breathe vapor and mist. Wash thoroughly after handling. Keep container closed. Refer to Section 8.

**Storage:** For safe storage, store at or below 38 °C (100.4 °F)  
Keep in a cool, well ventilated area away from heat, sparks and open flame. Keep container tightly closed until ready for use.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

Hazardous Component(s)	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
Methacrylic acid, monoester with 1,2-propanediol, polymer with 4,4'-methylene-diphenyl diisocyanate	None	None	None	None
Polyglycol dimethacrylate	None	None	None	None
Hydroxyalkyl methacrylate	None	None	None	1 ppm TWA 3 ppm STEL
Acrylic acid	2 ppm TWA (SKIN)	None	None	1 ppm TWA 3 ppm STEL (SKIN)
Cumene hydroperoxide	None	None	1 ppm (6 mg/m3) TWA (SKIN)	None
Cumene	50 ppm TWA	50 ppm (245 mg/m3) PEL (SKIN)	None	None
methacrylic acid	20 ppm TWA	None	None	None

**Engineering controls:** Provide adequate local exhaust ventilation to maintain worker exposure below exposure limits.

**Respiratory protection:** Use NIOSH approved respirator if there is potential to exceed exposure limit(s).

**Eye/face protection:** Safety goggles or safety glasses with side shields. Full face protection should be used if the potential for splashing or spraying of product exists. Safety showers and eye wash stations should be available.

**Skin protection:** Use chemical resistant, impermeable clothing including gloves and either an apron or body suit to prevent skin contact. Neoprene gloves. Butyl rubber gloves. Natural rubber gloves.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Physical state:</b>	Liquid
<b>Color:</b>	Green
<b>Odor:</b>	Sharp, Irritating
<b>Odor threshold:</b>	Not available.
<b>pH:</b>	Not applicable
<b>Vapor pressure:</b>	< 10 mm hg (27 °C (80.6 °F))
<b>Boiling point/range:</b>	> 149 °C (> 300.2 °F)
<b>Melting point/ range:</b>	Not available.
<b>Specific gravity:</b>	1.12
<b>Vapor density:</b>	Not available.
<b>Flash point:</b>	> 93.3 °C (> 199.94 °F) Tagliabue closed cup
<b>Flammable/Explosive limits - lower:</b>	Not available.
<b>Flammable/Explosive limits - upper:</b>	Not available.
<b>Autoignition temperature:</b>	Not available.
<b>Flammability:</b>	Not applicable

<b>Evaporation rate:</b>	Not available.
<b>Solubility in water:</b>	Slight
<b>Partition coefficient (n-octanol/water):</b>	Not available.
<b>VOC content:</b>	3.04 %; 29.05 g/l
<b>Viscosity:</b>	Not available.
<b>Decomposition temperature:</b>	Not available.

## 10. STABILITY AND REACTIVITY

<b>Stability:</b>	Stable under normal conditions of storage and use.
<b>Hazardous reactions:</b>	None under normal processing. Polymerization may occur at elevated temperature or in the presence of incompatible materials.
<b>Hazardous decomposition products:</b>	Oxides of carbon. Oxides of sulfur. Oxides of nitrogen. Irritating organic vapours.
<b>Incompatible materials:</b>	Strong oxidizing agents.
<b>Reactivity:</b>	Not available.
<b>Conditions to avoid:</b>	Elevated temperatures. Heat, flames, sparks and other sources of ignition. Store away from incompatible materials.

## 11. TOXICOLOGICAL INFORMATION

<b>Relevant routes of exposure:</b>	Skin, Inhalation, Eyes, Ingestion
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**Potential Health Effects/Symptoms**

**Inhalation:** Inhalation of vapors or mists of the product may be irritating to the respiratory system.  
**Skin contact:** Causes skin irritation. May cause allergic skin reaction.  
**Eye contact:** Causes serious eye damage.  
**Ingestion:** May cause gastrointestinal tract irritation if swallowed.

Hazardous Component(s)	LD50s and LC50s	Immediate and Delayed Health Effects
Methacrylic acid, monoester with 1,2-propanediol, polymer with 4,4'-methylene-diphenyl diisocyanate	None	Irritant, Allergen
Polyglycol dimethacrylate	None	Irritant, Allergen
Hydroxyalkyl methacrylate	None	Irritant, Allergen
Acrylic acid	Oral LD50 (Rat) = 33.5 mg/kg Oral LD50 (Mouse) = 2,400 mg/kg Oral LD50 (Rat) = 2.5 g/kg Oral LD50 (Rat) = 193 mg/kg Oral LD50 (Rat) = 1,250 mg/kg	Allergen, Corrosive, Irritant, Kidney, Liver
Cumene hydroperoxide	None	Allergen, Central nervous system, Corrosive, Irritant, Mutagen
Cumene	Oral LD50 (Rat) = 2.91 g/kg Oral LD50 (Rat) = 1,400 mg/kg	Central nervous system, Irritant, Lung
methacrylic acid	Oral LD50 (Mouse) = 1,332 mg/kg Oral LD50 (Mouse) = 1,600 mg/kg Oral LD50 (Mouse) = 1,250 mg/kg Oral LD50 (Rabbit) = 1,200 mg/kg Oral LD50 (Rat) = 1,060 mg/kg Oral LD50 (Rat) = 2,224 mg/kg Dermal LD50 (Rabbit) = 500 mg/kg	Corrosive, Irritant, Allergen

Hazardous Component(s)	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen (Specifically Regulated)
Methacrylic acid, monoester with 1,2-propanediol, polymer with 4,4'-methylene-diphenyl diisocyanate	No	No	No
Polyglycol dimethacrylate	No	No	No
Hydroxyalkyl methacrylate	No	No	No
Acrylic acid	No	No	No
Cumene hydroperoxide	No	No	No
Cumene	Reasonably Anticipated to be a Human Carcinogen.	Group 2B	No
methacrylic acid	No	No	No

**12. ECOLOGICAL INFORMATION**

**Ecological information:** Not available.

## 13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

**Recommended method of disposal:** Follow all local, state, federal and provincial regulations for disposal.  
**Hazardous waste number:** Not a RCRA hazardous waste.

## 14. TRANSPORT INFORMATION

The transport information provided in this section only applies to the material/formulation itself, and is not specific to any package/configuration.

### U.S. Department of Transportation Ground (49 CFR)

**Proper shipping name:** RQ, Environmentally hazardous substance, liquid, n.o.s.  
**Hazard class or division:** 9  
**Identification number:** UN 3082  
**Packing group:** III  
**DOT Hazardous Substance(s):** alpha,alpha-Dimethylbenzylhydroperoxide

### International Air Transportation (ICAO/IATA)

**Proper shipping name:** RQ, Environmentally hazardous substance, liquid, n.o.s.  
**Hazard class or division:** 9  
**Identification number:** UN 3082  
**Packing group:** III

### Water Transportation (IMO/IMDG)

**Proper shipping name:** RQ, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.  
**Hazard class or division:** 9  
**Identification number:** UN 3082  
**Packing group:** III

## 15. REGULATORY INFORMATION

### United States Regulatory Information

**TSCA 8 (b) Inventory Status:** All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.  
**TSCA 12 (b) Export Notification:** None above reporting de minimis  
**CERCLA/SARA Section 302 EHS:** None above reporting de minimis.  
**CERCLA/SARA Section 311/312:** Immediate Health, Delayed Health  
**CERCLA/SARA Section 313:** This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372). Acrylic acid (CAS# 79-10-7). Cumene hydroperoxide (CAS# 80-15-9). Cumene hydroperoxide (CAS# 80-15-9) 10 lbs. (4.54 kg)  
**CERCLA Reportable quantity:**  
**California Proposition 65:** This product contains a chemical known in the State of California to cause cancer. This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

### Canada Regulatory Information

**CEPA DSL/NDL Status:** One or more components are not listed on, and are not exempt from listing on either the Domestic Substances List or the Non-Domestic Substances List.

## 16. OTHER INFORMATION

This safety data sheet contains changes from the previous version in sections: 2, 14

**Prepared by:** Product Safety and Regulatory Affairs

**Issue date:** 10/17/2019

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# LOCTITE<sup>®</sup> 640<sup>™</sup>

December 2013

## PRODUCT DESCRIPTION

LOCTITE<sup>®</sup> 640<sup>™</sup> provides the following product characteristics:

<b>Technology</b>	Acrylic
<b>Chemical Type</b>	Urethane methacrylate
<b>Appearance (uncured)</b>	Green liquid <sup>LMS</sup>
<b>Fluorescence</b>	Positive under UV light <sup>LMS</sup>
<b>Components</b>	One component - requires no mixing
<b>Viscosity</b>	Low
<b>Cure</b>	Anaerobic
<b>Secondary Cure</b>	Activator
<b>Application</b>	Retaining
<b>Strength</b>	High

LOCTITE<sup>®</sup> 640<sup>™</sup> is designed for the bonding of cylindrical fitting parts. The product cures when confined in the absence of air between close fitting metal surfaces and prevents loosening and leakage from shock and vibration. Typical applications include retaining keys and splines, eliminating backlash in worn assemblies, retaining bearings in place - preventing spin out, retaining rotor to shafts in fractional and subfractional horsepower motors, retaining bushings and sleeves in housings and on shafts, augmenting press fits, restoring the fit to worn assemblies or out of tolerance parts.

### Mil-R-46082B

LOCTITE<sup>®</sup> 640<sup>™</sup> is tested to the lot requirements of Military Specification Mil-R-46082B. **Note:** This is a regional approval. Please contact your local Technical Service Center for more information and clarification.

### ASTM D5363

Each lot of adhesive produced in North America is tested to the general requirements defined in paragraphs 5.1.1 and 5.1.2 and to the Detail Requirements defined in section 5.2.

## TYPICAL PROPERTIES OF UNCURED MATERIAL

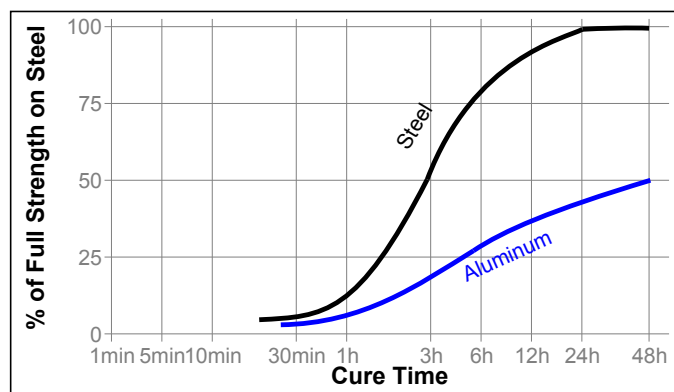
Specific Gravity @ 25 °C	1.2
Viscosity, Falling Ball 'D', @ 25 °C, mPa·s (cP)	450 to 750 <sup>LMS</sup>
Viscosity, Cannon Fenske, ISO 3104, mPa·s (cP): #400	*450 to 750 <sup>LMS</sup>

\* Applies to material made in N. America  
Flash Point - See SDS

## TYPICAL CURING PERFORMANCE

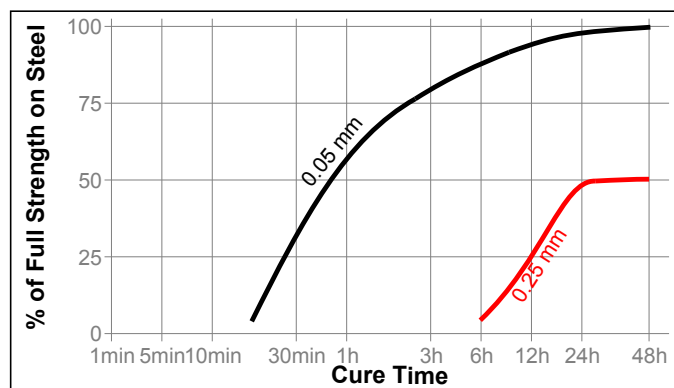
### Cure Speed vs. Substrate

The rate of cure will depend on the substrate used. The graph below shows the shear strength developed with time on steel pins and collars compared to different materials and tested according to ISO 10123.



### Cure Speed vs. Bond Gap

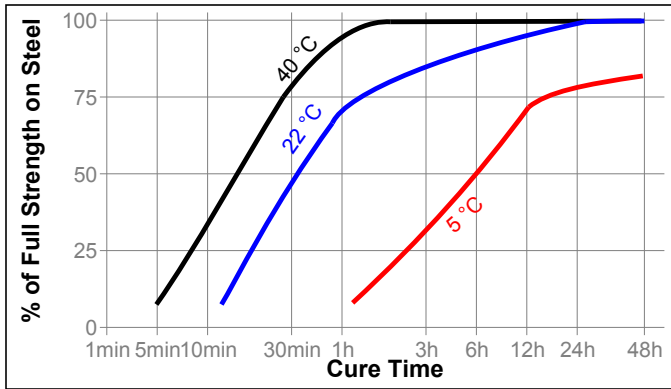
The rate of cure will depend on the bondline gap. The following graph shows the shear strength developed with time on steel pins and collars using Activator 7471<sup>™</sup> at different controlled gaps and tested according to ISO 10123.



### Cure Speed vs. Temperature

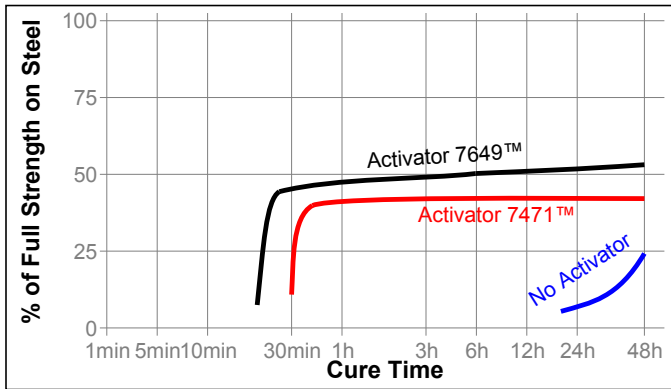
The rate of cure will depend on the temperature. The graph below shows the shear strength developed with time at different temperatures on steel pins and collars using Activator 7471<sup>™</sup> and tested according to ISO 10123.





**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 shear strength developed with time on zinc dichromate steel pins and collars using Activator 7471™ or 7649™ and tested according to ISO 10123.



**TYPICAL PROPERTIES OF CURED MATERIAL**

**Physical Properties:**

Coefficient of Thermal Expansion, ISO 11359-2, K <sup>-1</sup>	100×10 <sup>-6</sup>
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**

Cured for 30 minutes @ 22 °C, activated with Activator 7471™

Compressive Shear Strength, ISO 10123:	
Steel pins and collars	N/mm <sup>2</sup> ≥15 <sup>LMS</sup> (psi) (≥2,175)
Steel pins and collars	N/mm <sup>2</sup> * ≥11 <sup>LMS</sup> (psi) (≥1,595)

\* Applies to material made in N. America

Cured for 24 hours @ 22 °C

Compressive Shear Strength, ISO 10123:	
Steel pins and collars	N/mm <sup>2</sup> 22 (psi) (3,190)
Breakaway Torque, MIL-S-46163	N·m 20 to 40 (lb.in.) (175 to 350)
Prevail Torque, MIL-S-46163	N·m 30 to 60 (lb.in.) (265 to 530)
Breakloose Torque, ISO 10964, Pre-torqued to 5 N·m	N·m 30 to 50 (lb.in.) (265 to 440)
Max. Prevail Torque, ISO 10964, Pre-torqued to 5 N·m	N·m 40 to 60 (lb.in.) (350 to 530)

Heat Cured for 1 hour @ 93°C, tested @ 22 °C

Compressive Shear Strength, ISO 10123:	
Steel pins and collars	N/mm <sup>2</sup> ≥26 <sup>LMS</sup> (psi) (≥3,770)
Steel pins and collars	N/mm <sup>2</sup> * ≥22.7 <sup>LMS</sup> (psi) (≥3,291)

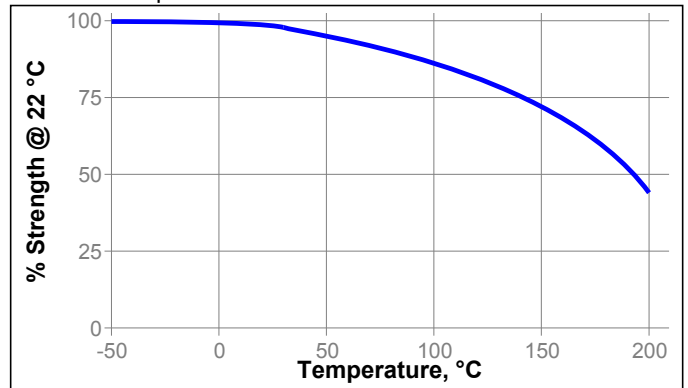
\* Applies to material made in N. America

**TYPICAL ENVIRONMENTAL RESISTANCE**

Cured for 1 week @ 22 °C

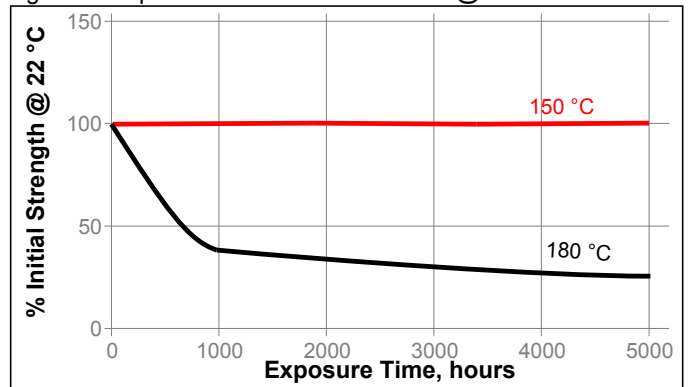
Compressive Shear Strength, ISO 10123:	
Steel pins and collars	

**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.

Environment	°C	% of initial strength		
		100 h	500 h	1000 h
Motor oil (MIL-L-46152)	125	100	100	100
Unleaded gasoline	22	100	100	100
Brake fluid	22	100	100	100
Water/glycol 50/50	87	100	90	75
Ethanol	22	100	100	100
Acetone	22	100	100	100

**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**

- For best results, clean all surfaces (external and internal) with a LOCTITE® cleaning solvent and allow to dry.
- If the material is an inactive metal or the cure speed is too slow, spray with Activator 7471™ or 7649™ and allow to dry.
- For Slip Fitted Assemblies**, apply adhesive around the leading edge of the pin and the inside of the collar and use a rotating motion during assembly to ensure good coverage.
- For Press Fitted Assemblies**, apply adhesive thoroughly to both bond surfaces and assemble at high press on rates.
- For Shrink Fitted Assemblies** the adhesive should be coated onto the pin, the collar should then be heated to create sufficient clearance for free assembly.
- Parts should not be disturbed until sufficient handling strength is achieved.

**For Disassembly**

- Apply localized heat to the assembly to approximately 250 °C. Disassemble while hot.

**For Cleanup**

- 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<sup>LMS</sup>**

LMS dated July 07, 2006 (\* February 15, 1996). 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**

$$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$$

$$\text{kV/mm} \times 25.4 = \text{V/mil}$$

$$\text{mm} / 25.4 = \text{inches}$$

$$\mu\text{m} / 25.4 = \text{mil}$$

$$\text{N} \times 0.225 = \text{lb}$$

$$\text{N/mm} \times 5.71 = \text{lb/in}$$

$$\text{N/mm}^2 \times 145 = \text{psi}$$

$$\text{MPa} \times 145 = \text{psi}$$

$$\text{N}\cdot\text{m} \times 8.851 = \text{lb}\cdot\text{in}$$

$$\text{N}\cdot\text{m} \times 0.738 = \text{lb}\cdot\text{ft}$$

$$\text{N}\cdot\text{mm} \times 0.142 = \text{oz}\cdot\text{ft}$$

$$\text{mPa}\cdot\text{s} = \text{cP}$$

**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 1.2