This safety data sheet has been prepared in accordance with the requirements of EC Directives 1999/45/EC and 2001/58/EC and provides information relating to the safe handling and use of the product.

1. PRODUCT AND COMPANY INFORMATION

Product Code	0128275
Trade Name	275
Manufacturer/Supplier	Henkel Loctite Adhesives Ltd.
Address	Watchmead, Welwyn Garden City, Herts., AL7IJB. UK
Phone Number	01 707 358800
Fax Number	01 707 358900
Emergency Phone Number	+353-1-4599301/+353-87-2629625/+353-1-4046444

2. COMPOSITION / INFORMATION ON INGREDIENTS

Nature
Anaerobic thread sealant.
Product based on polyethyleneglycol dimethacrylate.

Hazardous Components in Product for EC

Component Name	CAS / EINEC	Concentration	R Phrases	Classification
N,N-Diethyl-p-Toluidine	613-48-9 210-345-0	0.20 - 1.00	R23/24/25, R33	T
N,N-Dimethyl-o-Toluidine	609-72-3 210-199-8	0.05 - 0.50	R23/24/25, R33, R52/53	T
Cumene Hydroperoxide 80%	80-15-9 201-254-7	1.00 - 5.00	R7, R21/22, R23, R34, R48/20/22, R51/53	O, T, N

3. HAZARD IDENTIFICATION

Harmful by inhalation. Irritating to eyes and respiratory system.
Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Prolonged contact with skin, particularly damaged skin, may cause sensitization or dermatitis in sensitive individuals.

4. FIRST AID MEASURES

First Aid - Inhalation
Remove affected person to fresh air, and if still feeling unwell seek medical attention.

First Aid - Skin
Wash skin thoroughly with soap and water. Seek medical advice if irritation develops.

First Aid - Eyes
Flush eyes with plenty of water for at least 15 minutes. If irritation persists seek medical attention.

First Aid - Ingestion
Rinse mouth with water then give plenty of water to drink and seek medical advice.

5. FIRE FIGHTING MEASURES

Non flammable product (flash point is greater than 100°C (CC)). If product is involved in fire extinguish with dry powder, foam or carbon dioxide. Trace amounts of toxic fumes may be released on incineration and the use of breathing apparatus is recommended.

6. ACCIDENTAL RELEASE MEASURES

Ventilate area.
For small spills wipe up with paper towel and place in container for disposal.
For large spills absorb onto inert absorbent material and place in sealed container for disposal.
Wash spillage site thoroughly with soap and water or detergent solution.

7. HANDLING AND STORAGE

Handling

Use in a well ventilated area.
Avoid contact with skin and eyes.
Prolonged or repeated skin contact should be avoided to minimise any risk of sensitisation.

Storage

Store in original containers at 8°C-21°C and do not return residual materials to containers as contamination may reduce the shelf life of the bulk product.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Good industrial hygiene practices should be observed.
Use in well ventilated area. Avoid contact with skin and eyes. In circumstances where there is a potential for prolonged or repeated skin contact, the use of disposable gloves (polyethylene, natural rubber or equivalent ester-resistant material) is recommended. Safety glasses should be worn.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Paste.
Colour	Green.
Odour	Mild. Characteristic.
pH	Range between 3 to 6.
Boiling Range/Point (°C)	> 200
Flash Point (CC) (°C)	>100
Specific Gravity	1.08 g/ccm.
Solubility in Water (kg/m³)	Immiscible.
Solubility in Acetone	Miscible
Vapour Pressure (mmHg @25°C)	<0.1
Explosion Limits (%)	-

10. STABILITY AND REACTIVITY

Non reactive to water.
Non reactive to oxidising agents except for peroxides.
Polymerisation may occur after some time in the absence of air and/or the presence of a metal; However, the product is adequately stabilised to ensure that premature polymerisation does not occur under normal conditions of use.

11. TOXICOLOGICAL INFORMATION

Inhalation

This product is harmful by inhalation.
Irritating to respiratory system.

11. TOXICOLOGICAL INFORMATION

Skin
Although it is not a common sensitizer there may be a risk of sensitization on prolonged or repeated contact with damaged skin.

Eyes
Irritating to the eyes.

Ingestion
May cause irritation to the digestive tract.

12. ECOLOGICAL INFORMATION

Keep away from drains and open waters.
Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
There should be precautions taken against environmental damage caused by articles containing this product.

13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with all applicable local and national regulations.
Contribution of this product to waste is very insignificant in comparison to article in which it is used.

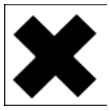
14. TRANSPORT INFORMATION

UN Number	None
Air (IATA)	Not classified.
Sea (IMO)	Not classified.
Road (ADR)/Rail (RID)	Not classified.

15. REGULATORY INFORMATION

Contains Cumene Hydroperoxide

Labelling Information



Harmful

R phrases
R20 Harmful by inhalation.
R36/37 Irritating to eyes and respiratory system.
R52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S phrases
S23 Do not breathe vapour.
S25 Avoid contact with eyes.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S51 Use only in well ventilated areas.
S61 Avoid release to the environment. Refer to special instructions/Safety data sheets.

Voluntary Labelling

16. OTHER INFORMATION

MSDS data revised 19 May 2003

Hazardous Components in Product for EC

Component Name	R Phrases
N,N-Diethyl-p-Toluidine	R23/24/25, R33
N,N-Dimethyl-o-Toluidine	R23/24/25, R33, R52/53
Cumene Hydroperoxide 80%	R7, R21/22, R23, R34, R48/20/22, R51/53

R21/22	R21/22 Harmful in contact with skin and if swallowed.
R23	R23 Toxic by inhalation.
R23/24/25	R23/24/25 Toxic by inhalation, in contact with skin and if swallowed.
R33	R33 Danger of cumulative effects.
R34	R34 Causes burns.
R48/20/22	R48/20/22 Harmful: danger of serious damage to health by prolonged exposure through inhalation and if swallowed.
R51/53	R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R52/53	R52/53 Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R7	R7 May cause fire.

Prepared by:

Vanessa Doherty
HRA Specialist
Health & Regulatory Affairs - Europe

Further Information may be obtained from:-

Loctite Corporation,
Health and Regulatory Affairs - Europe,
Tallaght Business Park,
Whitestown,
Dublin 24,
Ireland.

Tel: +353-1-4046444.
Fax: +353-1-4510806.

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Technical Data Sheet

LOCTITE® 275

June 2004

PRODUCT DESCRIPTION

LOCTITE® 275 provides the following product characteristics:

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

LOCTITE® 275 is designed for the permanent locking and sealing of threaded fasteners. 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 the locking and sealing of large bolts and studs (M25 and larger).

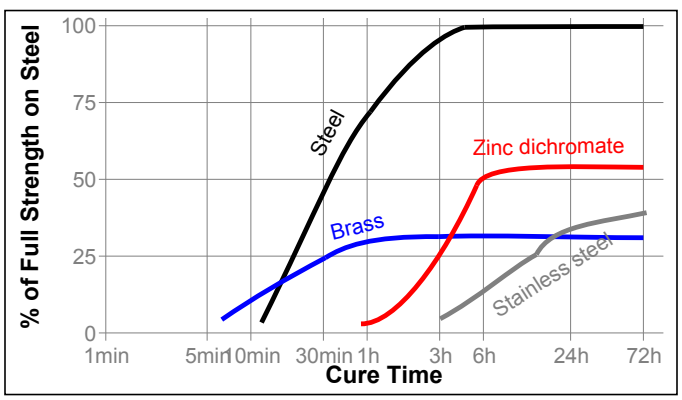
TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.1
Flash Point - See SDS	
Viscosity, Brookfield - RVT, 25 °C, mPa·s (cP):	
Spindle 5, speed 20 rpm,	5,000 to 10,000[LMS]

TYPICAL CURING PERFORMANCE

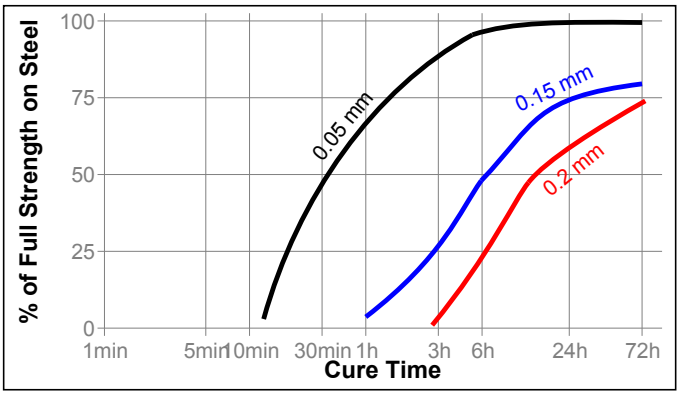
Cure Speed vs. Substrate

The rate of cure will depend on the substrate used. The graph below shows the breakaway strength developed with time on M10 black oxide nuts and bolts compared to different materials and tested according to MIL-S-46163.



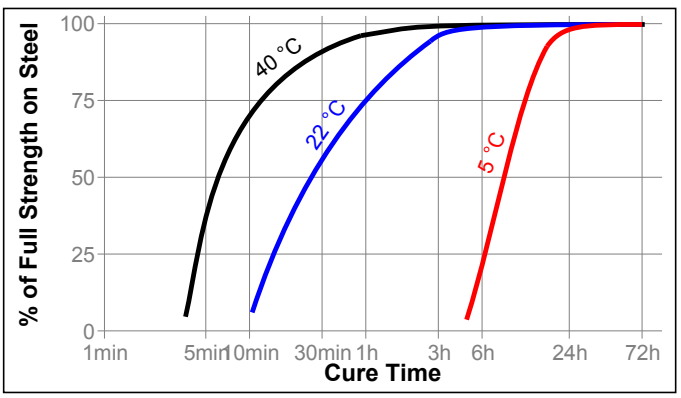
Cure Speed vs. Bond Gap

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 MIL-R-46082.



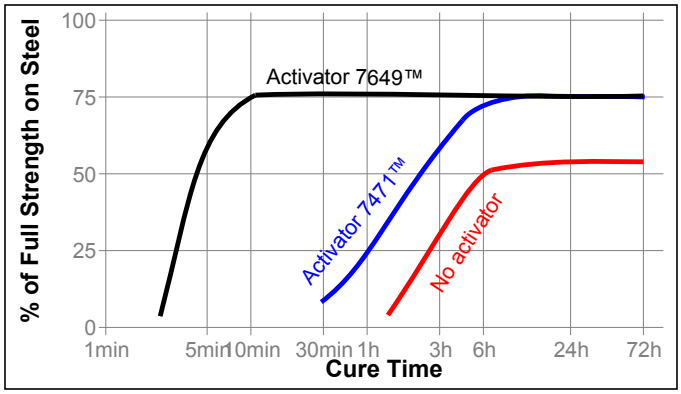
Cure Speed vs. Temperature

The rate of cure will depend on the temperature. The graph below shows the breakaway strength developed with time at different temperatures on M10 black oxide nuts and bolts and tested according to MIL-S-46163.



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 MIL-S-46163.



TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties:

Coefficient of Thermal Expansion, ISO 11359-2, K^{-1}	100×10^{-6}
Coefficient of Thermal Conductivity, ISO 8302, W/(m·K)	0.3
Specific Heat, kJ/(kg·K)	0.1

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

After 24 hours @ 22 °C

Breakaway Torque, ISO 10964:

M10 black nuts and bolts	oxide	steel	N·m (lb.in.)	15 to 36 (130 to 320)

Prevail Torque, ISO 10964:

M10 black nuts and bolts	oxide	steel	N·m (lb.in.)	20 to 50 (175 to 440)

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

M10 black nuts and bolts	oxide	steel	N·m (lb.in.)	25 to 50 (220 to 440)

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

M10 black nuts and bolts	oxide	steel	N·m (lb.in.)	35 to 65 (310 to 575)

Compressive Shear Strength, ISO 10123:

Steel pins and collars	N/mm²	≥11[LMS]
	(psi)	(≥1,595)

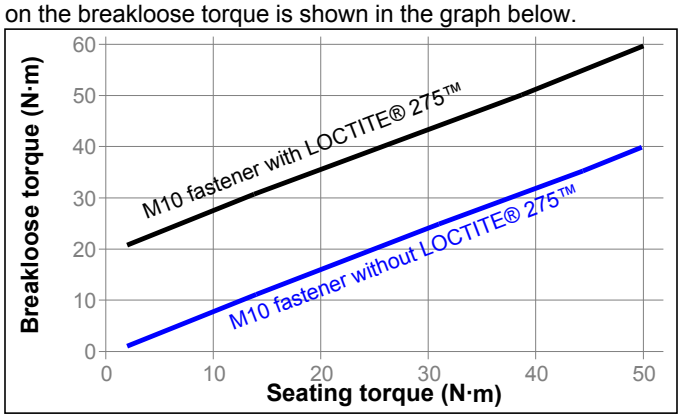
After 1 hour @ 22 °C

Compressive Shear Strength, ISO 10123:

Steel pins and collars	N/mm²	≥3[LMS]
	(psi)	(≥435)

Torque Augmentation

Breakloose torque of an uncoated fastener will normally be 15 to 30% less than the on-torque. The effect of LOCTITE® 275 on the breakloose torque is shown in the graph below.



TYPICAL ENVIRONMENTAL RESISTANCE

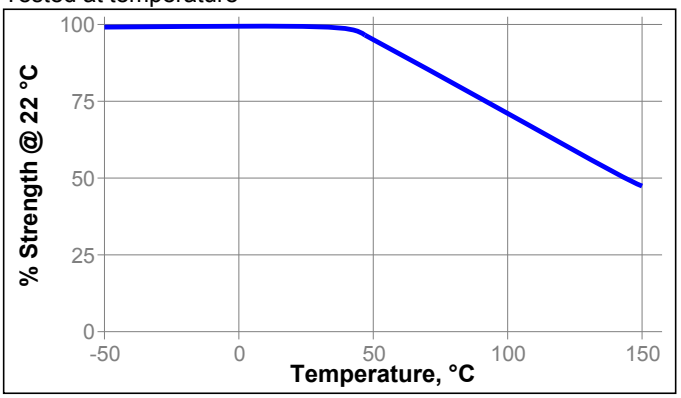
Cured for 1 week @ 22 °C

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

M10 zinc phosphate steel nuts and bolts:

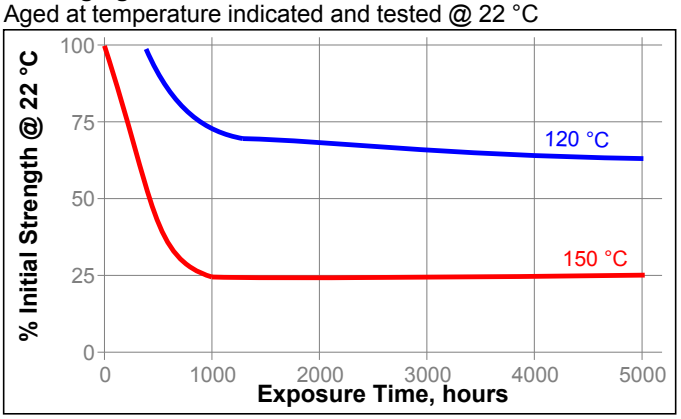
Hot Strength

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**
Motor oil (MIL-L-46152)	125	85	85	75
Gasoline	22	100	100	100
Brake fluid	22	100	100	100
Ethanol	22	95	95	95
Acetone	22	95	95	95
1,1,1 Trichloroethane	22	100	95	95
Water/glycol 50/50	87	100	85	85

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

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. To prevent the product from clogging in the nozzle, do not allow the tip to touch metal surfaces during application.
4. **For Thru Holes**, apply several drops of the product onto the bolt at the nut engagement area.
5. **For Blind Holes**, apply several drops of the product down the internal threads to the bottom of the hole.
6. **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.
7. Assemble and tighten as required.

For Disassembly

1. 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 April 20, 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

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 2