



## MATERIAL SAFETY DATA SHEET

### SECTION 1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

**Product Name:** LOCTITE 401 PRISM® INSTANT ADHESIVE

**Proper Shipping Name:** AVIATION REGULATED LIQUID, N.O.S. (CONTAINS CYANOACRYLATE ESTER) Note: Applicable for air transport only.

**Product Code(s):** 265607, 265618, 265620

**Part Number(s):** 40124-25 (25 ml), 33531 (100 ml), 33532 (500 ml)

**Use:** Cyanoacrylate adhesive

**Supplier:** HENKEL AUSTRALIA PTY. LIMITED ABN 82 001 302 996  
ADEHSIVE TECHNOLOGIES  
135-141 Canterbury Road, Kilsyth, Victoria, 3137. Tel: (03) 9724 6444  
24 HOUR EMERGENCY CONTACT NUMBER: Tel: 1800 032 379

### SECTION 2. HAZARDS IDENTIFICATION

#### STATEMENT OF HAZARDOUS NATURE:

Hazardous according to the criteria of Safe Work Australia. This material has been classified as Irritant (Xi).

#### Risk Phrase(s):

R36/37/38 - Irritating to eyes, respiratory system and skin.

#### Safety Phrase(s):

S2 Keep out of reach of children.  
S23 Do not breathe vapour.  
S24/25 - Avoid contact with skin and eyes.  
S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice  
S28 - After contact with skin, wash immediately with plenty of soap suds.  
S37/39 - Wear suitable gloves and eye/face protection.  
S46 - If swallowed, seek medical advice immediately and show this container or label.

#### DANGEROUS GOODS INFORMATION:

Not classified as Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code).

Classified as Dangerous Goods for air transport only.

**SUSDP POISON SCHEDULE:** 5

### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

#### INGREDIENTS:

CHEMICAL ENTITY	CAS NO.	PROPORTION
Ethyl cyanoacrylate	[7085-85-0]	> 60% w/w

### SECTION 4. FIRST AID MEASURES

**Ingestion:** For advice, contact a Poisons Information Centre (Phone 13 11 26) or a doctor. Ensure that breathing passages are not obstructed. The product will polymerise

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immediately in the mouth, making it almost impossible to swallow. Saliva will slowly separate the solidified product from the mouth (several hours).

**Skin:** Do not pull bonded skin apart. It may be gently peeled apart using a blunt object such as a spoon, preferably after soaking affected area in warm soapy water. Cyanoacrylates give off heat on solidification. In rare cases, a large drop will generate enough heat to cause a burn. Burns should be treated normally after the adhesive has been removed from the skin. If fingers stick together, apply a solvent such as acetone to contact areas, then wash off with water. Do not use solvents near eyes or open wounds.

If lips are accidentally stuck together, apply warm water to the lips and encourage maximum wetting and pressure from saliva inside the mouth. Peel or roll lips apart. Do not try to pull the lips apart with direct opposing action.

**Eyes:** If the eye is bonded closed, release eyelashes with warm water by covering with wet pad. Cyanoacrylate will bond to eye protein and will cause periods of weeping which will help to debond the adhesive. Keep eye covered until debonding is complete, usually within 1-3 days. Do not force eye open. Medical advice should be sought in case solid particles of cyanoacrylate trapped behind the eyelid cause any abrasive damage.

**Inhalation:** Remove affected person to fresh air. For all but the most minor symptoms, arrange for patient to be seen by a doctor.

**Advice to doctor:** Treat symptomatically.

**First Aid facilities:** Eye wash.

### SECTION 5. FIRE FIGHTING MEASURES

**Suitable extinguishing media:** Dry powder, foam or carbon dioxide.

**Hazards from combustion products:** Under fire conditions, it may release toxic fumes.

**Precautions for fire fighters and special protective equipment:** If there is a risk of exposure to products of combustion, fire-fighters should wear self-contained breathing apparatus.

### SECTION 6. ACCIDENTAL RELEASE MEASURES

Ventilate area. Do not use cloths for mopping up. Polymerise with water and scrape up. For large spills, wear protective gloves, chemical goggles and boots. Contain and collect spillage with inert absorbent materials (e.g. sand, earth, vermiculite). Transfer to sealable containers suitable for storing spilled material. Wash areas in contact with spilled material with adequate warm soapy water to render the area safe for human contact. Note: Residues are not water soluble. Do not allow product to enter drains. Dispose of solid residues in waste disposal area in accordance with relevant State and Federal requirements.

### SECTION 7. HANDLING AND STORAGE

**Safe Handling:** Observe recommendations made under SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION. Use in a well ventilated area. Handle carefully. This product will bond instantly in the presence of moisture. Avoid contact with fabric or paper as contact with these materials can generate smoke and irritating vapours.

**Storage:** Store indoors in a cool, dry and well ventilated area. Keep containers sealed when not in use. Store in original containers. Protect from physical damage. For optimum shelf life, store in original containers under refrigerated conditions at 2°C -10°C.

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### SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**National exposure standards:** TWA: 0.2 ppm (ACGIH) as for ethyl cyanoacrylate.

**Engineering controls:** None required under normal conditions of use, but if exposure limits are exceeded, use a local mechanical exhaust system.

**Personal protective equipment:** Avoid contact with skin and eyes. Wear overalls, polyethylene or nitrile rubber gloves and safety glasses with side shields. Do not use PVC, nylon or cotton gloves. Use with adequate ventilation. If inhalation risk exists, wear a respirator complying with the requirements of AS 1715 and AS 1716.

### SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

**Physical data:**

Appearance:	Clear, colourless liquid.
Solubility:	Polymerises in the presence of water
Flash point (TCC):	80°C to 93°C
Odour:	Sharp, characteristic
Specific gravity:	1.05 @ 20°C

### SECTION 10. STABILITY AND REACTIVITY

**Chemical stability:** Stable under normal conditions.

**Conditions to avoid:** Avoid open flames and heat.

**Incompatible materials:** Keep away from strong oxidising agents.

**Hazardous decomposition products:** Combustible material. In a fire, it may release toxic fumes.

**Other reactions:** Exothermic polymerisation will occur in the presence of water, amines, alkalies and alcohols.

### SECTION 11. TOXICOLOGICAL INFORMATION

#### HEALTH EFFECTS:

**Acute:**

**Ingestion:** Cyanoacrylates are considered to have relatively low toxicity. This product will rapidly polymerise in the mouth.

**Skin:** Irritating to skin. Bonds skin in seconds.

**Eyes:** Contact with the eyes will cause irritation. This product will bond eyelids. In a dry atmosphere, vapours may irritate the eyes.

**Inhalation:** Inhalation of vapours can cause respiratory irritation.

**Chronic:** Prolonged exposure to high concentrations of vapours may lead to chronic effects in sensitive individuals.

**Toxicity information:** Oral LD<sub>50</sub> (rat) : > 5000 mg/kg as for cyanoacrylates.



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### SECTION 12. ECOLOGICAL INFORMATION

Do not allow product to contaminate waterways or soil.

### SECTION 13. DISPOSAL CONSIDERATIONS

Polymerise by adding slowly to water (10:1). Dispose of solid residues at approved land waste site. Containers should be drained and residues be allowed to cure prior to disposal at approved landfill site.

### SECTION 14. TRANSPORT INFORMATION

Not classified as Dangerous Goods according to the criteria of the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code).

Classified as Dangerous Goods for air transport only. The appropriate air transport requirements shall apply.

U.N. Number: 3334  
Proper Shipping Name: AVIATION REGULATED LIQUID, N.O.S.(CONTAINS CYANOACRYLATE ESTER)  
Class: 9  
Packing Group: -  
Hazchem Code: -

### SECTION 15. REGULATORY INFORMATION

SUSDP POISON SCHEDULE: 5

### SECTION 16. OTHER INFORMATION

#### Abbreviations/acronyms:

SUSDP - Standard for the Uniform Scheduling of Drugs and Poisons

TWA - Time-weighted average.

ACGIH – American Conference of Governmental Industrial Hygienists.

#### DISCLAIMER:

The percentage weight (% w/w) of ingredients is not to be taken as a specification guaranteed by Henkel Australia Pty. Limited, but only as an approximate guide to the content of hazardous ingredients in the material. The information contained herein does not constitute a guarantee by Henkel Australia Pty. Limited concerning the properties of the material.

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# LOCTITE<sup>®</sup> 401<sup>™</sup>

June 2007

## PRODUCT DESCRIPTION

LOCTITE<sup>®</sup> 401<sup>™</sup> provides the following product characteristics:

<b>Technology</b>	Cyanoacrylate
<b>Chemical Type</b>	Ethyl cyanoacrylate
<b>Appearance (uncured)</b>	Transparent, colorless to straw colored liquid <sup>LMS</sup>
<b>Components</b>	One part - requires no mixing
<b>Viscosity</b>	Low
<b>Cure</b>	Humidity
<b>Application</b>	Bonding
<b>Key Substrates</b>	Wood, Paper, Leather and Fabric

LOCTITE<sup>®</sup> 401<sup>™</sup> is designed for the assembly of difficult-to-bond materials which require uniform stress distribution and strong tension and/or shear strength. The product provides rapid bonding of a wide range of materials, including metals, plastics and elastomers. LOCTITE<sup>®</sup> 401<sup>™</sup> is particularly suited for bonding porous or absorbent materials such as wood, paper, leather and fabric.

## TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.06
Flash Point - See MSDS	
Viscosity, Cone & Plate, mPa·s (cP):	
Temperature: 25 °C, Shear Rate: 3,000 s <sup>-1</sup>	70 to 110 <sup>LMS</sup>
Viscosity, Brookfield - LVF, 25 °C, mPa·s (cP):	
Spindle 1, speed 30 rpm	90 to 140

## TYPICAL CURING PERFORMANCE

Under normal conditions, the atmospheric moisture initiates the curing process. Although full functional strength is developed in a relatively short time, curing continues for at least 24 hours before full chemical/solvent resistance is developed.

### Cure Speed vs. Substrate

The rate of cure will depend on the substrate used. The table below shows the fixture time achieved on different materials at 22 °C / 50 % relative humidity. This is defined as the time to develop a shear strength of 0.1 N/mm<sup>2</sup>.

Fixture Time, seconds:	
Steel	20 to 45
Aluminum	2 to 10
Zinc dichromate	10 to 30
Neoprene	<5
Rubber, nitrile	<5
ABS	1 to 2
PVC	3 to 10
Polycarbonate	5 to 10
Phenolic	<2
Wood (balsa)	<1

Wood (oak)	10 to 30
Wood (pine)	10 to 20
Chipboard	5 to 10
Fabric	10 to 20
Leather	5 to 10
Paper	5 to 10

### Cure Speed vs. Bond Gap

The rate of cure will depend on the bondline gap. Thin bond lines result in high cure speeds, increasing the bond gap will decrease the rate of cure.

### Cure Speed vs. Humidity

The rate of cure will depend on the ambient relative humidity. Higher relative humidity levels result in more rapid speed of cure.

### Cure Speed vs. Activator

Where cure speed is unacceptably long due to large gaps, applying activator to the surface will improve cure speed. However, this can reduce ultimate strength of the bond and therefore testing is recommended to confirm effect.

## TYPICAL PROPERTIES OF CURED MATERIAL

Cured for 1 week @ 22 °C

### Physical Properties:

Coefficient of Thermal Expansion, ISO 11359-2, K <sup>-1</sup>	107×10 <sup>-6</sup>
Coefficient of Thermal Conductivity, ISO 8302, W/(m·K)	0.4
Glass Transition Temperature, ISO 11359-2, °C	121

### Electrical Properties:

Volume Resistivity, IEC 60093, Ω·cm	277×10 <sup>15</sup>
Surface Resistivity, IEC 60093, Ω	69×10 <sup>15</sup>
Dielectric Breakdown Strength, IEC 60243-1, kV/mm	33
Dielectric Constant / Dissipation Factor, IEC 60250:	
1 kHz	2.72 / 0.02
1 MHz	2.53 / 0.02
10 MHz	2.42 / 0.01

## TYPICAL PERFORMANCE OF CURED MATERIAL

### Adhesive Properties

Cured for 10 seconds @ 22 °C

Tensile Strength, ISO 6922:

Buna-N	N/mm <sup>2</sup> ≥6.9 <sup>LMS</sup>
	(psi) (≥1,000)

Cured for 72 hours @ 22 °C

Tensile Strength, ISO 6922:

Buna-N	N/mm <sup>2</sup> 8 to 15
	(psi) (1,200 to 2,200)

Steel (grit blasted)	N/mm <sup>2</sup> 7 to 16 (psi) (1,000 to 2,300)
Lap Shear Strength, ISO 4587:	
Steel (grit blasted)	N/mm <sup>2</sup> 17 to 24 (psi) (2,500 to 3,500)
Aluminum (etched)	N/mm <sup>2</sup> 2 to 11 (psi) (290 to 1,600)
Zinc dichromate	N/mm <sup>2</sup> 0.5 to 2 (psi) (70 to 290)
ABS	N/mm <sup>2</sup> 7 to 9 (psi) (1,000 to 1,300)
PVC	N/mm <sup>2</sup> 7 to 16 (psi) (1,000 to 2,300)
Phenolic	N/mm <sup>2</sup> 1 to 5 (psi) (150 to 730)
Polycarbonate	N/mm <sup>2</sup> 7 to 11 (psi) (1,000 to 1,600)
Nitrile	N/mm <sup>2</sup> 1 to 2 (psi) (150 to 290)
Neoprene	N/mm <sup>2</sup> 1 to 2 (psi) (150 to 290)

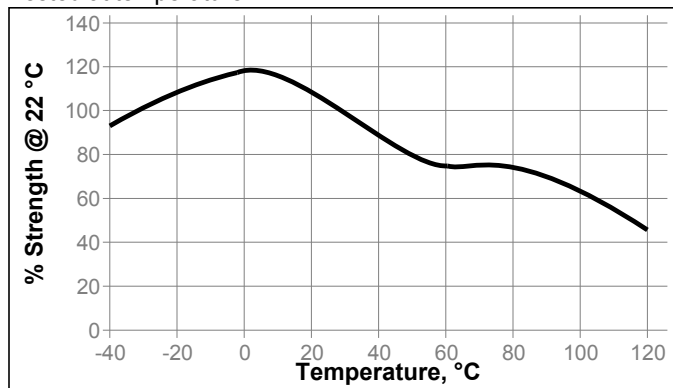
### TYPICAL ENVIRONMENTAL RESISTANCE

Cured for 1 week @ 22 °C

Lap Shear Strength, ISO 4587:  
Steel (grit blasted)

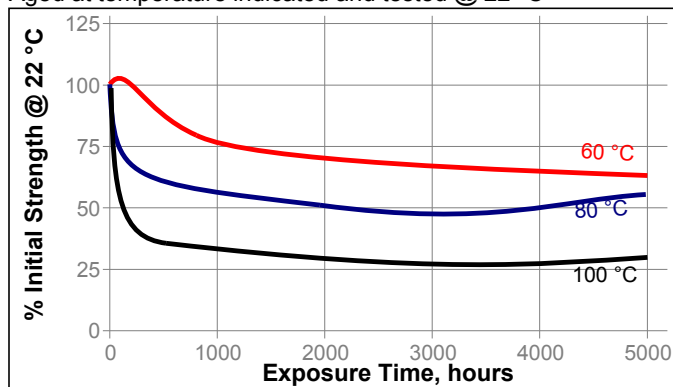
### Hot Strength

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	5000 h
Motor oil	40	120	110	110	85
Unleaded gasoline	22	85	80	80	75
Ethanol	22	100	105	110	120
Isopropanol	22	100	110	105	120
Water	22	80	70	55	65
98% RH	40	70	60	55	55

Lap Shear Strength, ISO 4587:  
Polycarbonate

Environment	°C	% of initial strength			
		100 h	500 h	1000 h	5000 h
Air	22	120	125	115	130
98% RH	40	120	110	120	115

### 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).

### Directions for use

1. Bond areas should be clean and free from grease. Clean all surfaces with a Loctite® cleaning solvent and allow to dry.
2. Loctite® Primer may be applied to the bond area. Avoid applying excess Primer. Allow the Primer to dry.
3. LOCTITE® Activator may be used if necessary. Apply the LOCTITE® Activator to one bond surface (do not apply activator to the primed surface where Primer is also used). Allow the Activator to dry.
4. Apply adhesive to one of the bond surfaces (do not apply the adhesive to the activated surface). Do not use items like tissue or a brush to spread the adhesive. Assemble the parts within a few seconds. The parts should be accurately located, as the short fixture time leaves little opportunity for adjustment.
5. LOCTITE® Activator can be used to cure fillets of product outside the bond area. Spray or drop the activator on the excess product.
6. Bonds should be held fixed or clamped until adhesive has fixtured.
7. Product should be allowed to develop full strength before subjecting to any service loads (typically 24 to 72 hours after assembly, depending on bond gap, materials and ambient conditions).

**Loctite Material Specification<sup>LMS</sup>**

LMS dated December 16, 2003. 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: 2 °C to 8 °C. Storage below 2 °C or greater than 8 °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**

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$   
 $\text{kV/mm} \times 25.4 = \text{V/mil}$   
 $\text{mm} / 25.4 = \text{inches}$   
 $\mu\text{m} / 25.4 = \text{mil}$   
 $\text{N} \times 0.225 = \text{lb}$   
 $\text{N/mm} \times 5.71 = \text{lb/in}$   
 $\text{N/mm}^2 \times 145 = \text{psi}$   
 $\text{MPa} \times 145 = \text{psi}$   
 $\text{N}\cdot\text{m} \times 8.851 = \text{lb}\cdot\text{in}$   
 $\text{N}\cdot\text{m} \times 0.738 = \text{lb}\cdot\text{ft}$   
 $\text{N}\cdot\text{mm} \times 0.142 = \text{oz}\cdot\text{in}$   
 $\text{mPa}\cdot\text{s} = \text{cP}$

**Note**

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## Reference 2.1