

## Safety Data Sheet

LOCTITE 416 INSTANT ADHESIVE known as 416 INSTANT ADHESIVE 20 G

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SDS No.: 153534 V001.2 Revision: 29.03.2021 printing date: 25.05.2022

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

LOCTITE 416 INSTANT ADHESIVE known as 416 INSTANT ADHESIVE 20 G Adhesive

Intended use: Supplier:

**Product name:** 

Henkel New Zealand Ltd 2 Allens Rd Auckland, 2013 New Zealand Phone: +64 (9) 272-6710

**Emergency information:** 

24 HOUR EMERGENCY CONTACT NUMBER 0800 243 622

#### **SECTION 2 HAZARDS IDENTIFICATION**

#### Classification of the substance or mixture

Classified as hazardous under the New Zealand Hazardous Substances and New Organisms Act (HSNO). Not classified as Dangerous Goods under the Land Transport Rule: Dangerous Goods 2005.

#### **GHS Classification:**

Hazard Class	Hazard Category	Target organ
Flammable liquids	Category 4	
Skin irritation	Category 2	
Serious eye irritation	Category 2A	
Target Organ Systemic Toxicant -	Category 3	respiratory trac
Single exposure		1 2

Hazard pictogram:



Signal word:

ract irritation

Hazard statement(s):	H227 Combustible liquid. H315 Causes skin irritation. H319 Causes serious eye irritation. H335 May cause respiratory irritation.
Precautionary Statement(s):	
Prevention:	P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
	P264 Wash hands thoroughly after handling.
	P271 Use only outdoors or in a well-ventilated area.
	P280 Wear protective gloves, eye protection, and face protection.
Response:	P302+P352 IF ON SKIN: Wash with plenty of water. P304+P340+P312 IF INHALED: Remove victim to fresh air and keep at rest in a position
	comfortable for breathing. Call a POISON CENTER or physician if you feel unwell.
	P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
	P332+P313 If skin irritation occurs: Get medical advice/attention.
	P337+P313 If eye irritation persists: Get medical advice/attention.
	P362 Take off contaminated clothing.
	P370+P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
Storage:	P403+P233 Store in a well-ventilated place. Keep container tightly closed. P405 Store locked up.
Disposal:	P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations.

## SECTION 3 COMPOSITION/INFORMATION ON INGREDIENTS

General chemical description:	Mixture
Type of preparation:	Cy anoacry late Adhesive

## Identity of ingredients:

Chemical ingredients	CAS-No.	Proportion
Ethyl 2-cyanoacrylate	7085-85-0	60- < 90 %
Bis(2-hydroxy-3-tert-butyl-5-methylphenyl)methane	119-47-1	0.1-< 1%
non hazardous ingredients~		10-< 30 %

## SECTION 4 FIRST AID MEASURES

Ingestion:	Ensure that breathing passages are not obstructed. The product will polymerise 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 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 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:	Move to fresh air, consult doctor if complaint persists.
First Aid facilities:	Eye wash Normal washroom facilities
Medical attention and special treatment:	Surgery is not necessary to separate accidentally bonded tissues. Experience has shown that bonded tissues are best treated by passive, non-surgical first aid. If rapid curing has caused thermal burns they should be treated symptomatically after adhesive is removed.

## SECTION 5. FIRE FIGHTING MEASURES

Suitable extinguishing media:	Foam, extinguishing powder, carbon dioxide. Fine water spray
Improper extinguishing media:	High pressure waterjet
Decomposition products in case of fire:	Oxides of carbon, oxides of nitrogen, irritating organic vapors.
Particular danger in case of fire:	Isolate from heat, electrical equipment, sparks, and open flame.
Special protective equipment for fire-fighters:	Fire fighters should wear positive pressure self-contained breathing apparatus (SCBA).

## SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions:	Ensure adequate ventilation. See advice in section 8
Environmental precautions:	Do not let product enter drains.
Clean-up methods:	Do not use cloths for moppingup. Flood with water to complete polymerization and scrape off the floor. Cured material can be disposed of as non-hazardous waste.

## SECTION 7. HANDLING AND STORAGE

Precautions for safe handling:	Ventilation (low level) is recommended when using large volumes Do not inhale vapors and fumes. Wash thoroughly after handling. Use of dispensing equipment is recommended to minimise the risk of skin or eye contact Avoid contact with fabric or paper goods. Contact with these materials may cause rapid polymerization which can generate smoke and strong irritating vapors, and cause thermal burns.
Conditions for safe storage:	For optimum shelf life store in original containers under refrigerated conditions at 2 - $8^{\circ}C$ (35.6 - 46.4 °F)

## SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

#### Workplace exposure standards:

None

#### **Biological Exposure Indices:** None

Engineering controls:	Ensure good ventilation/extraction.
Eye protection:	Wear protective glasses.
Skin protection:	Protective clothing that covers arms and legs. The use of chemical resistant gloves such as Nitrile is recommended. Polyethylene or polypropylene gloves are recommended when using large volumes. Do not use PVC, rubber or nylon gloves. Please note that in practice the working life of chemical resistant gloves may be considerably reduced as a result of many influencing factors (e.g. temperature). Suitable risk assessment should be carried out by the end user. If signs of wear and tear are noticed then the gloves should be replaced.
Respiratory protection:	Ensure adequate ventilation. If inhalation risk exists, wear a respirator or air supplied mask complying with the requirements of AS/NZS 1715 and AS/NZS 1716.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:
Odor:
Odor threshold (CA):
Specific gravity:
Boiling point:
Flash point:
(Tagliabue closed cup)
Vapor density:

Auto ignition:

## liquid irritating 1 - 2 ppm 1.1 > 149 °C (> 300.2 °F) 80 - 93 °C (176 - 199.4 °F) 3 Approximately 485 °C

**Decomposition temperature:** 

clear

#### **SECTION 10. STABILITY AND REACTIVITY**

Stability:	Stable under recommended storage conditions.	
Conditions to avoid:	Stable under normal conditions of storage and use.	
Incompatible materials:	Rapid exothermic polymerization will occur in the presence of water, amines, alkalis and alcohols.	
Hazardous decomposition products:	None if used for intended purpose.	

## SECTION 11 TOXICOLOGICAL INFORMATION

Not expected to be harmful by ingestion. Rapidly polymerizes (solidifies) and bonds in mouth. It
is almost impossible to swallow.
Cyanoacrylates generate heat on solidification. In rare circumstances a large drop will burn the
skin. Cured adhesive does not present a health hazard even if bonded to the skin.
Bonds skin in seconds. May cause skin irritation. Cyanoacrylates have been reported to cause
allergic reaction but due to rapid polymerization at the skin surface, an allergic response is rare.
Causes serious eye irritation.
May cause respiratory tract irritation.

#### Acute toxicity:

Hazardous components	Value	Value	Route of	Exposure	Species	Method
CAS-No.	type		application	time		
Ethyl 2-cyanoacrylate	LD50	> 5,000  mg/kg	oral		rat	OECD Guideline 401 (Acute
7085-85-0	LD50	> 2,000  mg/kg			rabbit	Oral Toxicity)
			dermal			OECD Guideline 402 (Acute
						Dermal Toxicity)
Bis(2-hydroxy-3-tert-	LD50	>10,000 mg/kg	oral		rat	not specified
buty1-5-	LD50	> 10,000  mg/kg			rat	not specified
methylphenyl)methane			dermal			1
119-47-1						

#### Skin corrosion/irritation:

Hazardous components CAS-No.	Result	Exposure time	Species	Method
Ethyl 2-cyanoacrylate 7085-85-0	slightly irritating	24 h	rabbit	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)

#### Serious eye damage/irritation:

Hazardous components CAS-No.	Result	Exposure time	Species	Method
Ethyl 2-cyanoacrylate 7085-85-0	irritating	72 h	rabbit	OECD Guideline 405 (Acute Eye Irritation / Corrosion)

#### Respiratory or skin sensitization:

Hazardous components CAS-No.	Result	Test type	Species	Method
Ethyl 2-cyanoacrylate 7085-85-0	not sensitising		guinea pig	not specified

#### Germ cell mutagenicity:

Hazardous components CAS-No.	Result	Type of study/ Route of administration	Metabolic activation / Exposure time	Species	Method
Ethyl 2-cyanoacrylate 7085-85-0	negative negative negative	bacterial reverse mutation assay (e.g Ames test) mammalian cell gene mutation assay in vitro mammalian chromosome aberration test	with and without with and without		OECD Guideline 471 (Bacterial Reverse Mutation Assay) OECD Guideline 476 (In vitro Mammalian Cell Gene Mutation Test) OECD Guideline 473 (In vitro Mammalian Chromosome Aberration Test)
Bis(2-hydroxy-3-tert- butyl-5- methylphenyl)methane 119-47-1	negative	bacterial reverse mutation assay (e.g Ames test)	with and without		OECD Guideline 471 (Bacterial Reverse Mutation Assay)

## SECTION 12. ECOLOGICAL INFORMATION

## LOCTITE 416 INSTANT ADHESIVE known as 416 **INSTANT ADHESIVE 20 G**

#### General ecological information:

Do not empty into drains / surface water / ground water.

#### Toxicity:

Hazardous components CAS-No.	Value type	Value	Acute Toxicity Study	Exposure time	Species	Method
Bis(2-hydroxy-3-tert-butyl-5- methylphenyl)methane 119-47-1	LC50	Toxicity>Water solubility	Fish		Oryzias latipes	OECD Guideline 203 (Fish, Acute Toxicity Test)
Bis(2-hydroxy-3-tert-butyl-5- methylphenyl)methane 119-47-1	EC50	Toxicity > Water solubility	Daphnia	48 h	Daphnia magna	OECD Guideline 202 (Daphniasp. Acute Immobilisation Test)
Bis(2-hydroxy-3-tert-butyl-5- methylphenyl)methane 119-47-1	EC50	Toxicity>Water solubility	Algae	72 h	Pseudokirchneriella subcapitata (reported as Selenastrum capricornutum)	OECD Guideline 201 (Alga, Growth Inhibition Test)
Bis(2-hydroxy-3-tert-butyl-5- methylphenyl)methane 119-47-1	NOEC	Toxicity>Water solubility	Algae	72 h	Pseudokirchneriella subcapitata (reported as Selenastrum capricornutum)	OECD Guideline 201 (Alga, Growth Inhibition Test)
Bis(2-hydroxy-3-tert-butyl-5- methylphenyl)methane 119-47-1	EC 50	> 10,000 mg/l	Bacteria	3 h		OECD Guideline 209 (Activated Sludge, Respiration Inhibition Test)

## Persistence and degradability:

Haz ardous components	Result	Route of	Degradability	Method
CAS-No.		application		
Ethyl 2-cyanoacrylate	not readily biodegradable.	aerobic	57 %	OECD Guideline 301 D (Ready
7085-85-0				Biodegradability: Closed Bottle
				Test)
Bis(2-hydroxy-3-tert-butyl-5-	under test conditions no	aerobic	0 %	OECD Guideline 301 C (Ready
methylphenyl)methane	biodegradation observed			Biodegradability: Modified MITI
119-47-1	-			Test (I))

#### Bioaccumulative potential / Mobility in soil:

Hazardous components CAS-No.	LogPow	Bioconcentration factor (BCF)	Exposure time	Species	Temperature	Method
Ethyl 2-cyanoacrylate 7085-85-0	0.776				22 °C	EU Method A.8 (Partition Coefficient)
Bis(2-hydroxy-3-tert-butyl-5- methylphenyl)methane 119-47-1		320 - 780	60 d	Cyprinus carpio		OECD Guideline 305 E (Bioaccumulation: Flow- through Fish Test)
Bis(2-hydroxy-3-tert-butyl-5- methylphenyl)methane 119-47-1	6.25				20 °C	OECD Guideline 107 (Partition Coefficient (n- octanol/water), Shake Flask Method)

#### **DISPOSAL CONSIDERATIONS** SECTION 13.

Waste disposal of product:	Cured adhesive: Dispose of as water insoluble non-toxic solid chemical in authorised landfill or incinerate under controlled conditions. Dispose of in accordance with local and national regulations. Contribution of this product to waste is very insignificant in comparison to article in which it is used
Disposal for uncleaned package:	After use, tubes, cartons and bottles containing residual product should be disposed of as chemically contaminated waste in an authorised legal land fill site or incinerated. Disposal must be made according to official regulations.

#### **TRANSPORT INFORMATION** SECTION 14.

## **Dangerous Goods information:**

#### Land Transport:

Not classified as Dangerous Goods under the Land Transport Rule: Dangerous Goods 2005.

# Marine transport IMDG: Not dangerous goods

#### Air transport IATA:

UN no.:	3334
Proper shipping name:	Aviation regulated liquid, n.o.s. (Cyanoacrylate ester)
Class or division:	9
Packing group:	III
Packing instructions (passenger)	964
Packing instructions (cargo)	964
Additional Information IATA:	Primary packs containing less than 500ml are unregulated by this mode of transport and may be shipped unrestricted.

#### SECTION 15. **REGULATORY INFORMATION**

#### New Zealand regulatory information:

Classified as hazardous under the New Zealand Hazardous Substances and New Organisms Act (HSNO).

HSNO Approval Number:	Group standard HSR002657
NZIoC:	Compliant for NZIOC

#### **SECTION 16. OTHER INFORMATION**

Abbreviations/acronyms:	HSNO - Hazardous Substances and New Organisms IMDG: International Maritime Dangerous Goods code IATA-DGR: International Air Transport Association – Dangerous Goods Regulations
Reason for issue:	Reviewed SDS. Reissued with new date. involved chapters:

23.05.2016
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**Technical Data Sheet** 

# LOCTITE<sup>®</sup> 416™

January 2010

#### **PRODUCT DESCRIPTION**

 $LOCTITE^{\ensuremath{\mathbb{R}}}$  416<sup>TM</sup> provides the following product characteristics:

Technology	Cyanoacrylate		
Chemical Type	Ethyl cyanoacrylate		
Appearance (uncured)	Transparent clear liquid <sup>LMS</sup>		
Components	One part - requires no mixing		
Viscosity	High		
Cure	Humidity		
Application	Bonding		
Key Substrates	Plastics, Rubbers and Metals		

LOCTITE<sup>®</sup> 416<sup>™</sup> is a general purpose cyanoacrylate instant adhesive.

#### Mil-A-46050C

LOCTITE<sup>®</sup> 416<sup>™</sup> is tested to the lot requirements of Military Specification Mil-A-46050C. **Note:** This is a regional approval. Please contact your local Technical Service Center for more information and clarification.

#### Commercial Item Description A-A-3097:

LOCTITE<sup>®</sup> 416<sup>™</sup> has been qualified to Commercial Item Description A-A-3097. **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	1.05
Viscosity, Cone & Plate, mPa·s (cP):	
Temperature: 25 °C, Shear Rate: 100 s <sup>-1</sup>	900 to 1,500 <sup>LMS</sup>
Viscosity, Brookfield - LVF, 25 °C, mPa·s (cP):	
Spindle 2, speed 12 rpm,	1,150 to 1,500
Vapour Pressure, hPa	<1
Flash Point - See SDS	

#### 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:

Mild Steel (degreased)	20 to 50
Aluminum	10 to 30
Zinc dichromate	40 to 100

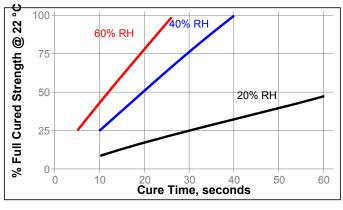
Neoprene	<5
Rubber, nitrile	<5
ABS	15 to 40
PVC	20 to 50
Polycarbonate	30 to 70
Phenolic	10 to 40

#### 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. The following graph shows the tensile strength developed with time on Buna N rubber at different levels of humidity.



#### 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

## After 24 hours @ 22 °C

10 kHz

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
Softening Point, DIN EN 1427, °C	165
Electrical Properties:	
Dielectric Constant / Dissipation Factor, IEC 60	0250:
0.1 kHz 2 t	o 3.3 / <0.02
1 kHz 2 t	o 3.5 / <0.02

Volume Resistivity, IEC 60093, Ω·cm	2×10 <sup>15</sup> to 10×10 <sup>15</sup>
Surface Resistivity, IEC 60093, Ω	10×10 <sup>15</sup> to 80×10 <sup>15</sup>
Dielectric Breakdown Strength,	25
IEC 60243-1, kV/mm	

2 to 3.5 / <0.02

18 to 26

12 to 19

6 to 13

6 to 20

6 to 20

5 to 20

5 to 15

5 to 15

5 to 15

(2,610 to 3,770)

(1,740 to 2,755)

(870 to 1,885)

(870 to 2,900)

(870 to 2,900)

(725 to 2,900)

(725 to 2,175)

(725 to 2,175)

(725 to 2,175)

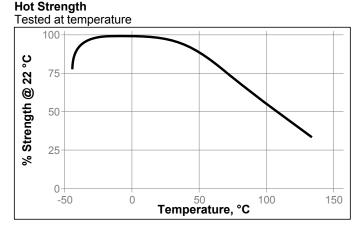
#### TYPICAL PERFORMANCE OF CURED MATERIAL **Adhesive Properties**

After 24 hours @ 22 °C Lap Shear Strength, ISO 4587: Steel (grit blasted) N/mm<sup>2</sup> (psi) Aluminum (etched) N/mm<sup>2</sup> (psi) Zinc dichromate N/mm<sup>2</sup> (psi) ABS N/mm<sup>2</sup> (psi) PVC N/mm<sup>2</sup> (psi) Polycarbonate N/mm<sup>2</sup> (psi) Phenolic N/mm<sup>2</sup> (psi) Neoprene N/mm<sup>2</sup> (psi) Nitrile N/mm<sup>2</sup> (psi) Tensile Strength, ISO 6922:

Steel	N/mm² (psi)	12 to 25 (1,740 to 3,625)
Buna-N	· · · ·	5 to 15 (725 to 2,175)
"T" Peel Strength, ISO 11339: Steel (degreased)	N/mm (lb/in)	<0.5 (<2.8)
After 10 seconds @ 22 °C Tensile Strength, ISO 6922:		
Buna-N	N/mm² (psi)	≥6.0 <sup>LMS</sup> (≥870)

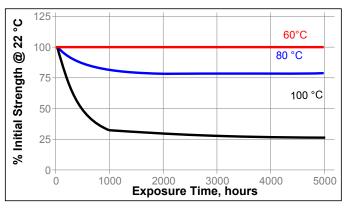
#### TYPICAL ENVIRONMENTAL RESISTANCE

Cured for 1 week @ 22 °C Lap Shear Strength, ISO 4587: Mild Steel (grit blasted)



#### **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)	40	100	100	95
Gasoline	22	100	100	100
Isopropanol	22	100	100	100
Ethanol	22	100	100	100
Freon TA	22	100	100	100
1,1,1 Trichloroethane	22	100	100	100
Heat/humidity 95% RH	40	80	75	65
Heat/humidity 95% RH on polycarbonate	40	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).

#### **Directions for use:**

- 1. For best performance bond surfaces should be clean and free from grease.
- 2. This product performs best in thin bond gaps (0.05 mm).
- 3. Excess adhesive can be dissolved with Loctite cleanup solvents, nitromethane or acetone.

#### Loctite Material Specification

LMS dated October 10, 2005. 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

 $(^{\circ}C \ge 1.8) + 32 = ^{\circ}F$ kV/mm x 25.4 = V/mil mm / 25.4 = inches  $\mu$ m / 25.4 = mil N x 0.225 = lb N/mm x 5.71 = lb/in N/mm<sup>2</sup> 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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