Technical Data Sheet

LOCTITE® 435™

December 2020

PRODUCT DESCRIPTION

LOCTITE® 435™ provides the following product characteristics:

Technology	Cyanoacrylate
Chemical Type	Ethyl cyanoacrylate
Appearance (uncured)	Colorless to straw colored, slightly cloudy liquid[LMS]
Components	One part - requires no mixing
Viscosity	Low
Cure	Humidity
Application	Bonding
Key Substrates	Metals , Plastics and Rubbers

LOCTITE® 435™ is a rubber toughened adhesive with increased flexibility and peel strength along with enhanced resistance to shock. The product provides rapid bonding on a wide range of materials, including metals, plastics and elastomers, as well as porous and absorbent materials like wood, paper, leather and fabric.

ISO-10993

LOCTITE® 435™ has been tested to Henkel's test protocols based on ISO 10993 biocompatibility standards, as a means to assist in the selection of products for use in the medical device industry.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C 1.1

Flash Point - See SDS

Viscosity, Cone & Plate, mPa·s (cP):
Temperature: 25 °C, Shear Rate: 1,000 s^{-1} 100 to 250[LMS]

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/mm² .

Fixture Time, seconds:	
Steel (degreased)	30 to 45
Aluminum (Isopropanol wiped)	≤60[LMS]
Zinc dichromate	90 to 105
Neoprene	30 to 45
Rubber, nitrile	<5
SBR	90 to 105
ABS	10 to 20
PVC	60 to 75
Polycarbonate	45 to 60
Phenolic	10 to 20
G-10 Epoxy	45 to 60
Wood (oak)	75 to 90
Wood (balsa)	<5

Cure Speed vs. Bond Gap

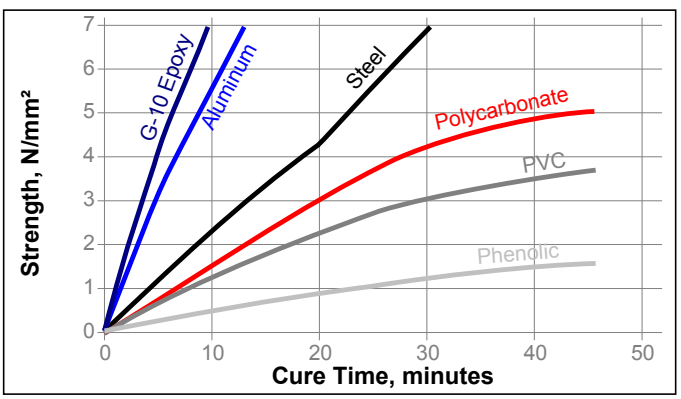
The rate of cure will depend on the bondline gap. Thin bond lines result in high cure speeds, increasing the bond gap will decrease the rate of cure.

Cure Speed vs. 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.

Cure Speed vs. Time

The graph below shows the shear strength developed over time at 22 °C / 50 % RH on various substrates and tested according to ISO 4587.



TYPICAL PROPERTIES OF CURED MATERIAL

Cured for 24 hours @ 22°C

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
Glass Transition Temperature ISO 11359-2, °C	130

Electrical Properties:

Surface Resistivity, IEC 60093, Ω	10×10^{15}
Volume Resistivity, IEC 60093, Ω·cm	10×10^{15}
Dielectric Breakdown Strength, IEC 60243-1, kV/mm	25
Dielectric Constant / Dissipation Factor, IEC 60250:	
0.1 kHz	2.65 / <0.02
1 kHz	2.75 / <0.02
10 kHz	2.75 / <0.02

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 24 hours @ 22°C

Lap Shear Strength, :

Steel (grit blasted)	N/mm² (psi)	19 (2,700)
Aluminum	N/mm² (psi)	15 (2,200)
Nitrile	N/mm² (psi)	0.4 (60)
EPDM	N/mm² (psi)	0.5 (80)

Block Shear Strength, ISO 13445:

ABS	N/mm² (psi)	14 (2,000)
PVC	N/mm² (psi)	9 (1,300)
Polycarbonate	N/mm² (psi)	6 (840)
Phenolic	N/mm² (psi)	13 (1,800)
G-10 Epoxy	N/mm² (psi)	20 (2,900)

Tensile Strength, ISO 6922:

Steel (grit blasted)	N/mm² (psi)	30 (4,400)
Buna-N	N/mm² (psi)	3 (400)

Side Impact Resistance, , J:

Aluminum	≥4[LMS]

Cured for 48 hours @ 22°C

Lap Shear Strength, :

Steel (grit blasted)	N/mm² (psi)	≥15[LMS] (≥2,175)

180° Peel Strength, ISO 8510-2:

Steel (grit blasted)	N/mm (lb/in)	4 (20)

TYPICAL ENVIRONMENTAL RESISTANCE

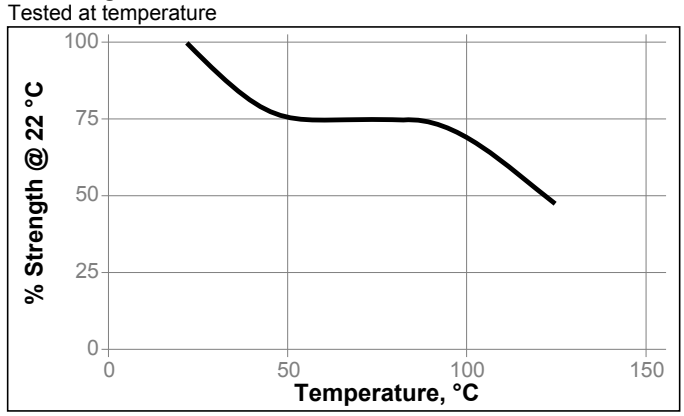
Cured for 72 hours @ 22°C

Lap Shear Strength, ISO 4587:

Steel (grit blasted)

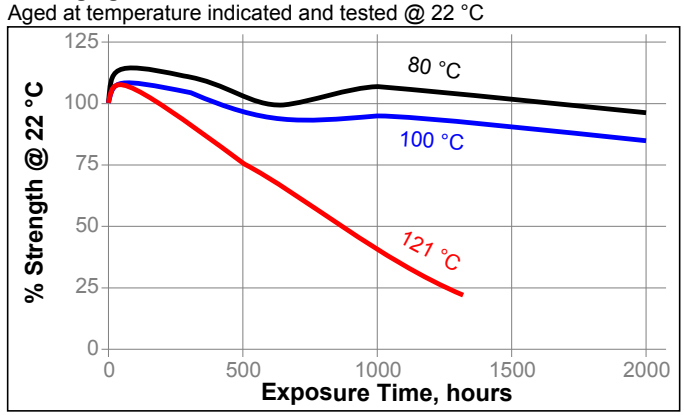
Hot Strength

Tested at temperature



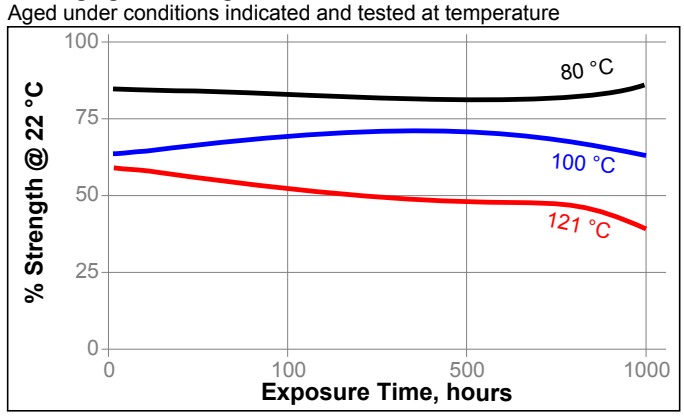
Heat Aging

Aged at temperature indicated and tested @ 22 °C



Heat Aging/Hot Strength

Aged under conditions indicated and tested at temperature



Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 22 °C

		% of initial strength		
Environment	**°C**	**100 h**	**500 h**	**1000 h**
Motor oil	40	100	100	100
Gasoline	22	100	100	90
Ethanol	22	100	100	100
Isopropanol	22	100	100	100
Heat/humidity 95% RH	40	100	100	100

Cured for 72 hours @ 22°C
Block Shear Strength, ISO 13445:
Polycarbonate

Chemical/Solvent Resistance
Aged under conditions indicated and tested @ 22 °C.

		% of initial strength		
Environment	**°C**	**100 h**	**500 h**	**1000 h**
Heat/humidity 95% RH	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]
LMS dated November 01, 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 Henkel 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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Reference 1.4