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Loctite UK Limited

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Technical Data Sheet

Product 4105

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PRODUCT DESCRIPTION

LOCTITE® Product 4105 is a black, rubber toughened ethyl cyanoacrylate adhesive with enhanced resistance to peel and shock loads.

TYPICAL APPLICATIONS

Bonding rubbers, metals and plastics for use in difficult environments

PROPERTIES OF UNCURED MATERIAL

	Value	Typical Range
Chemical Type	Ethyl cyanoacrylate	
Appearance	Black Liquid	
Specific Gravity @ 25°C	1.1	
Viscosity @ 25°C, mPa.s (cP)		
Brookfield RTV		
Spindle 3 @ 20 rpm	5,000	4,000 to 7,000
Flash Point (TCC), °C	>93	

TYPICAL CURING PERFORMANCE

Under normal conditions, the surface moisture initiates the hardening 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 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 (14.5 psi) tested on specimens according to ASTM D1002.

Substrate	Fixture Time, seconds
Steel (degreased)	60 to 120
Aluminium	10 to 30
Neoprene	15 to 25
Nitrile rubber	15 to 25
ABS	20 to 50
PVC	50 to 100
Polycarbonate	30 to 90
Phenolic materials	20 to 60

Cure speed vs. bond gap

The rate of cure will depend on the bondline gap. High cure speed is favoured by thin bond lines. Increasing the bond gap will slow down 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 the ultimate strength of the bond, therefore testing is recommended to confirm effect.

TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties

Coefficient of thermal expansion, ASTM D696, K ⁻¹	80x10 ⁻⁶
Coefficient of thermal conductivity, ASTM C177, W.m ⁻¹ K ⁻¹	0.1
Glass Transition temperature, ASTM E228, °C	120

Electrical Properties

	Constant	Loss
Dielectric constant & loss, 25°C, ASTM D150:		
measured at 50Hz:	2.3	<0.02
1kHz:	2.3	<0.02
1MHz:	2.3	<0.02
Volume resistivity, ASTM D257, Ω.cm		1 x 10 ¹⁶
Dielectric strength, ASTM D149, kV/mm		25

PERFORMANCE OF CURED MATERIAL

(After 24 hr at 22°C)	Value	Typical Range
Shear Strength, ASTM D1002, DIN 53283		
Grit Blasted Steel, N/mm ²	22	18 to 26
(psi)	(3190)	(2610 to 3770)
Etched Aluminium, N/mm ²	15	11 to 19
(psi)	(2175)	(1595 to 2755)
ABS, N/mm ²	>6	
(psi)	(>870)	
PVC, N/mm ²	>6	
(psi)	(>870)	
Polycarbonate, N/mm ²	>5	
(psi)	(>750)	
Phenolic, N/mm ²	10	5 to 15
(psi)	(1450)	(700 to 2200)
Neoprene rubber, N/mm ²	>10	
(psi)	(>1450)	
Nitrile rubber, N/mm ²	>10	
(psi)	(>1450)	
Tensile Strength, ASTM D2095, DIN 53282		
Grit Blasted Steel, N/mm ²	18.5	12 to 25
(psi)	(2700)	(1700 to 3600)

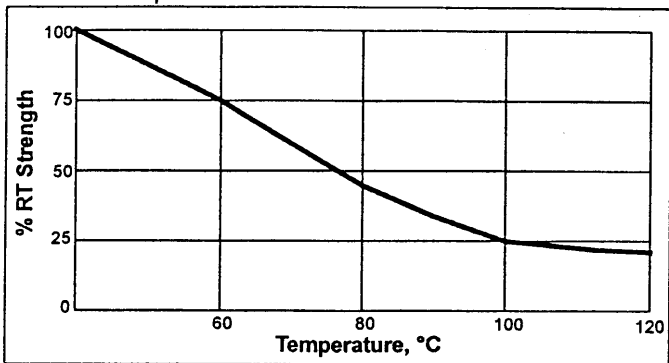
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THE TECHNICAL DATA CONTAINED HEREIN ARE INTENDED AS REFERENCE ONLY.
PLEASE CONTACT LOCTITE CORPORATION QUALITY DEPARTMENT FOR ASSISTANCE AND RECOMMENDATIONS ON SPECIFICATIONS FOR THIS PRODUCT.
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TYPICAL ENVIRONMENTAL RESISTANCE

Test Procedure: Shear Strength ASTM D1002/DIN 53283
 Substrate: Grit blasted mild steel laps
 Cure procedure: 1 week at 22°C

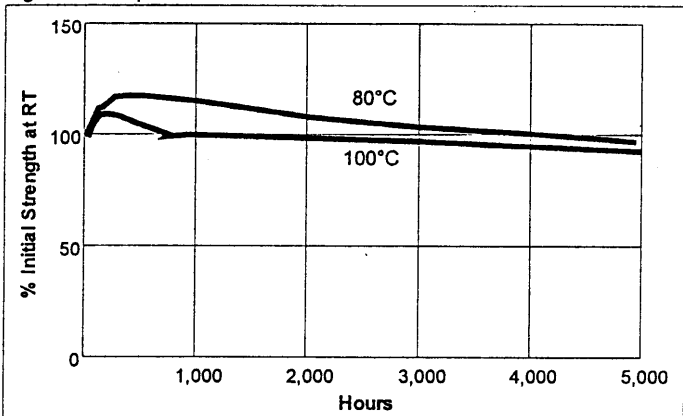
Hot Strength

Tested at temperature.



Heat Ageing

Aged at temperature indicated and tested at 22°C.



Chemical/Solvent Resistance

Aged under conditions indicated and tested at 22°C.

Solvent	Temp.	%Initial strength retained at		
		100 hr	500 hr	1000 hr
Motor Oil	40°C	85	85	85
Gasoline	22°C	90	70	70
Isopropanol	22°C	75	75	75
Industrial Methylated Spirits	22°C	95	95	80
Freon TA	22°C	90	90	85
Humidity 95% RH	40°C	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 oxidising materials.

For safe handling information on this product, consult the Material Safety Data Sheet, (MSDS).

Directions for use

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

Storage

Product shall be ideally stored in a cool, dry location in unopened containers at a temperature between 8°C to 21°C (46°F to 70°F) unless otherwise labelled. Optimal storage conditions for unopened containers of cyanoacrylate products are achieved with refrigeration: 2°C to 8°C (36°F to 46°F). Refrigerated packages shall be allowed to return to room temperature prior to opening and use. To prevent contamination of unused product, do not return any material to its original container. For specific shelf life information contact your local Technical Service Centre.

Data Ranges

The data contained herein may be reported as a typical value and/or range (based on the mean value ±2 standard deviations). Values are based on actual test data and are verified on a periodic basis.

Note

The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof. In light of the foregoing, Loctite Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Loctite Corporation's products. Loctite Corporation specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits. The discussion herein of various processes or compositions is not to be interpreted as representation that they are free from domination of patents owned by others or as a license under any Loctite Corporation patents that may cover such processes or compositions. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide. This product may be covered by one or more United States or foreign patents or patent applications.

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