



# LOCTITE<sup>®</sup> 4203<sup>™</sup>

March 2010

## PRODUCT DESCRIPTION

LOCTITE<sup>®</sup> 4203<sup>™</sup> provides the following product characteristics:

<b>Technology</b>	Cyanoacrylate
<b>Chemical Type</b>	Ethyl cyanoacrylate
<b>Appearance (uncured)</b>	Colorless to slightly pale yellow liquid <small>LMS</small>
<b>Components</b>	One part - requires no mixing
<b>Viscosity</b>	Low
<b>Cure</b>	Humidity
<b>Application</b>	Bonding
<b>Key Substrates</b>	Rubbers, Plastics and Metals

LOCTITE<sup>®</sup> 4203<sup>™</sup> is a general purpose adhesive suitable for applications where heat resistance is required. LOCTITE<sup>®</sup> 4203<sup>™</sup> is toughened with elastomers for flexibility, impact resistance and improved resistance to heat and humidity.

## TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.1
Viscosity, Brookfield - RVT, 25 °C, mPa·s (cP): Spindle 5, speed 20 rpm	150 to 600 <sup>LMS</sup>
Viscosity, Cone & Plate, 25 °C, mPa·s (cP): Physica MC100, Cone MK 22, shear rate 100 s <sup>-1</sup>	150 to 600 <sup>LMS</sup>
Flash Point - See MSDS	

## 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 (degreased)	10 to 20
Aluminum	10 to 20
ABS	10 to 20
SBR (smooth)	90 to 120
NBR	10 to 20
EPDM	45 to 55
Phenolic	40 to 50
Zinc dichromate	60 to 75
Neoprene	20 to 30
PVC	45 to 55
Polycarbonate	60 to 75
G-10 Epoxy	10 to 20
Wood (pine)	75 to 90

## 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.

## TYPICAL PERFORMANCE OF CURED MATERIAL

### Adhesive Properties

Cured for 24 hours @ 22 °C

Lap Shear Strength, ISO 4587:

Steel (grit blasted)	N/mm <sup>2</sup>	21.2 to 21.7
	(psi)	(3,075 to 3,145)
Aluminum	N/mm <sup>2</sup>	13.7 to 14.2
	(psi)	(1,990 to 2,060)
SBR	N/mm <sup>2</sup>	0.3 to 0.4
	(psi)	(45 to 60)
Nitrile	N/mm <sup>2</sup>	0.4 to 0.7
	(psi)	(60 to 100)
Phenolic	N/mm <sup>2</sup>	8.6 to 9.5
	(psi)	(1,250 to 1,380)
Neoprene	N/mm <sup>2</sup>	0.5 to 0.6
	(psi)	(70 to 90)

Block Shear Strength, ISO 13445:

ABS	N/mm <sup>2</sup>	5.4 to 5.8
	(psi)	(780 to 840)
Phenolic	N/mm <sup>2</sup>	10 to 12
	(psi)	(1,450 to 1,740)
G-10 Epoxy	N/mm <sup>2</sup>	11 to 12
	(psi)	(1,600 to 1,740)

Side Impact Resistance, J:

Aluminum, as received, (Isopropanol wiped) ≥4.5<sup>LMS</sup>

Cured for 24 hours @ 22 °C, followed by 24 hours @ 121 °C, tested @ 121 °C

Lap Shear Strength, ISO 4587:

Steel (grit blasted)	N/mm <sup>2</sup>	≥5.6 <sup>LMS</sup>
	(psi)	(≥810)

Cured for 24 hours @ 22 °C, followed by 24 hours @ 121 °C, tested @ 22 °C

Lap Shear Strength, ISO 4587:

Steel (grit blasted)	N/mm <sup>2</sup>	≥18.6 <sup>LMS</sup>
	(psi)	(≥2,700)

Cured for 48 hours @ 22 °C

Lap Shear Strength, ISO 4587:

Steel (grit blasted) N/mm<sup>2</sup> ≥12.4<sup>LMS</sup>  
(psi) (≥1,800)

180° Peel Strength, ISO 8510-2:

Steel (grit blasted) N/mm 3.5  
(lb/in) (20)

**TYPICAL ENVIRONMENTAL RESISTANCE**

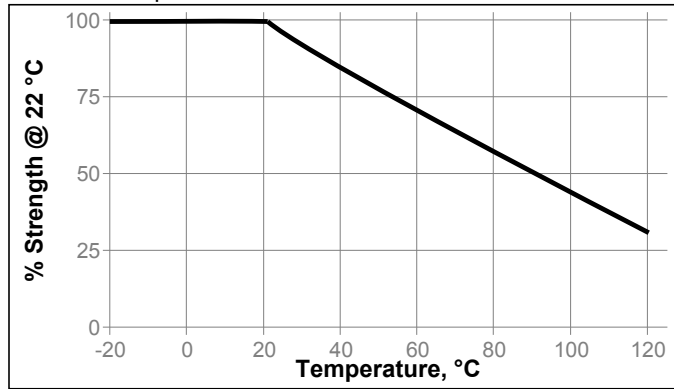
Cured for 72 hours @ 22 °C

Lap Shear Strength, ISO 4587:

Mild steel (grit blasted)

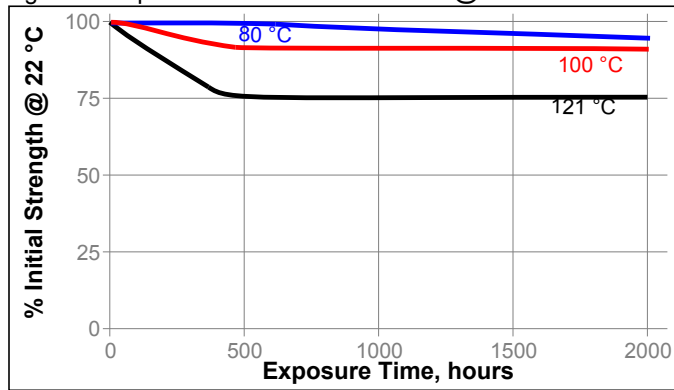
**Hot Strength**

Tested at temperature



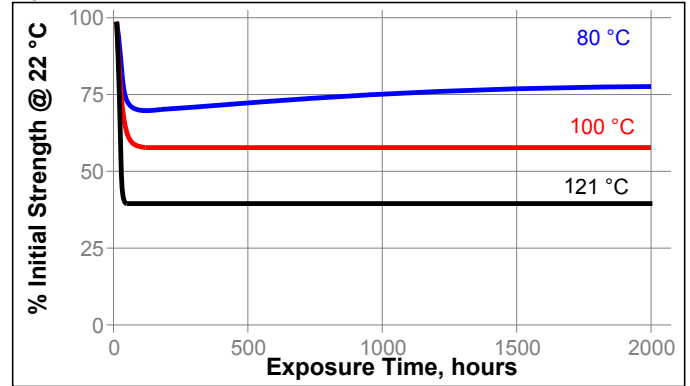
**Heat Aging**

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

Environment	°C	% of initial strength		
		100 h	500 h	100 h
Motor oil	40	105	105	105
Gasoline	22	105	100	90
Ethanol	22	105	100	100
Isopropanol	22	105	100	100
Heat/humidity 95% RH	40	90	95	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 Material Safety Data Sheet (MSDS).

**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<sup>LMS</sup>**

LMS dated October 14, 2009. 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**

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, **Henkel Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel 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 Henkel 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.

**Trademark usage**

Except as otherwise noted, all trademarks in this document are trademarks of Henkel Corporation in the U.S. and elsewhere. ® denotes a trademark registered in the U.S. Patent and Trademark Office.

Reference 1.3