

LOCTITE[®] 4203[™]

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PRODUCT DESCRIPTION

LOCTITE[®] 4203[™] provides the following product characteristics:

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

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

ISO-10993

LOCTITE[®] 4203[™] 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
Viscosity, Brookfield - RVT, 25 °C, mPa·s (cP):	
Spindle 5, speed 20 rpm	150 to 600 ^{LMS}
Viscosity, Cone & Plate, 25 °C, mPa·s (cP):	
Physica MC100, Cone MK 22, shear rate 100 s ⁻¹	150 to 600 ^{LMS}

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/mm².

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

Block Shear Strength, ISO 13445:

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

Side Impact Resistance, J:

Aluminum, as received, (Isopropanol wiped)	≥4.5 ^{LMS}
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Cured for 24 hours @ 22 °C, followed by 24 hours @ 121 °C, tested @ 121 °C

Lap Shear Strength, :	
Steel (grit blasted)	N/mm ² ≥5.6 ^{LMS} (psi) (≥810)

Conversions

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

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Reference 1.7