



LOCTITE® 3951™

July 2005

PRODUCT DESCRIPTION

LOCTITE® 3951™ provides the following product characteristics:

Technology	Urethane
Chemical Type	Polyurethane
Appearance (uncured)	Black paste ^{LMS}
Components	One component - requires no mixing
Viscosity	Thixotropic paste
Cure	Atmospheric moisture
Secondary Cure	Activator
Application	Bonding

LOCTITE® 3951™ is a general purpose polyurethane elastomeric adhesive which cures at ambient temperature under the influence of atmospheric moisture. Typical applications include bonding a wide variety of metals, plastics, wood and glass particularly where good joint flexibility is required. For best adhesion and durability it is recommended to use LOCTITE® polyurethane activators as appropriate. The thixotropic nature of LOCTITE® 3951™ reduces the migration of liquid product after application to the substrate.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.12
Flash Point - See MSDS	
Extrusion Rate, g/min:	
Pressure 0.6 MPa, temperature 25 °C:	
3.5 mm Nozzle	≥3.5 ^{LMS}

TYPICAL CURING PERFORMANCE

Tack Free Time

Tack Free Time is the time required to achieve a tack free surface.

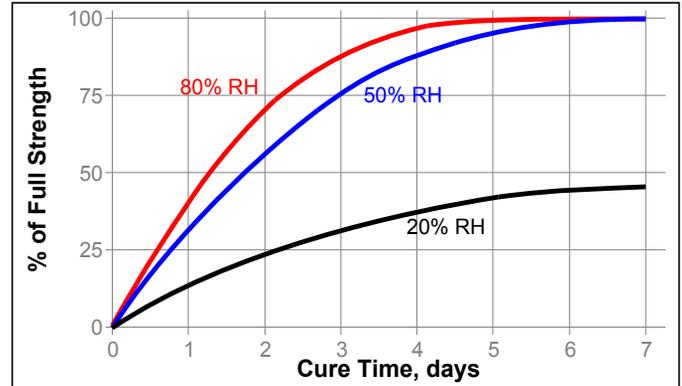
Tack Free Time, @ 22 °C, minutes	≤45 ^{LMS}
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Depth of Cure

Depth of cure, mm:	
24 hours @ 25 °C	≥1.8 ^{LMS}

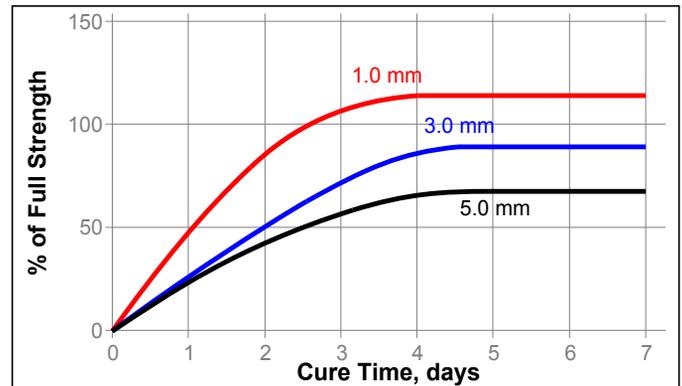
Cure Speed vs. Humidity

The following graph shows the rate of cure at different humidities at 22°C on polycarbonate, activated with LOCTITE® 7251™, with a bond gap of 3.0 mm. Strength is determined according to ISO 4587.



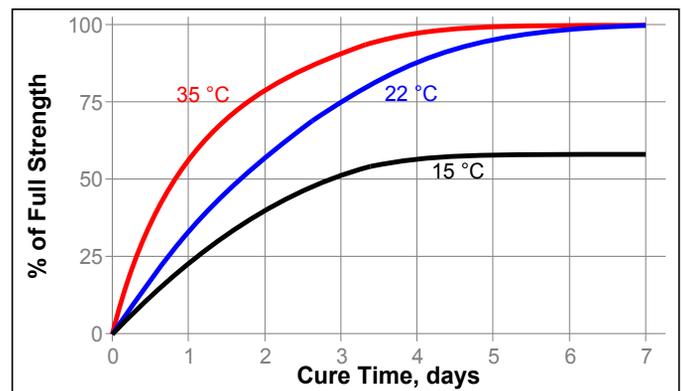
Cure Speed vs. Bond Gap

The following graph shows the rate of cure at different bond gaps at 22°C, 50% RH on polycarbonate, activated with LOCTITE® 7251™. Strength is determined according to ISO 4587.



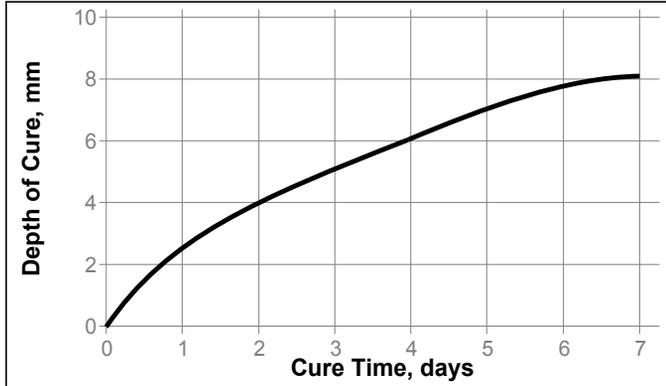
Cure Speed vs. Temperature

The following graph shows the rate of cure at different temperatures at 50% RH on polycarbonate, activated with LOCTITE® 7251™, with a bond gap of 3.0 mm. Strength is determined according to ISO 4587.



Depth of Cure

The graph below shows the increase in depth of cure with time at 23±2°C / 50±5% RH. This is determined by peeling away the product from a 10 mm wide channel in a PTFE block. The channel gradually increases in depth from 0 to 10 mm. The point where the product remains in the channel is measured.



TYPICAL PROPERTIES OF CURED MATERIAL

After 7 days @ 22 °C / 50% RH

Physical Properties:

Shore Hardness, ISO 868, Durometer A	50 to 70
Elongation, at break, ASTM D 638, %	650 to 800
Tensile Strength, ASTM D 638	N/mm ² 9 to 16 (psi) (1,300 to 2,320)

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

After 7 days @ 22 °C / 50% RH, 3.0 mm gap

"T" Peel Strength, ISO 11339:

Steel	N/mm	2.0 to 4.0
	(lb/in)	(11.4 to 22.8)

Lap Shear Strength, ISO 4587:

Steel (grit blasted)	N/mm ²	1.0 to 2.5
	(psi)	(145 to 360)
Polycarbonate	N/mm ²	1.0 to 3.0
	(psi)	(145 to 435)

TYPICAL ENVIRONMENTAL RESISTANCE

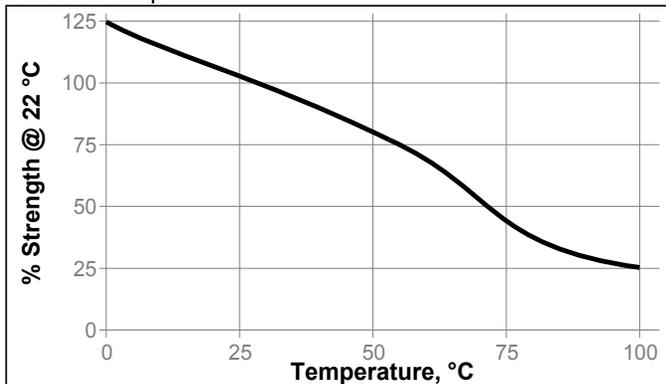
Cured for 7 days @ 22 °C / 50% RH, 3.0 mm gap, Activator 7251™ on 1 side

Lap Shear Strength, ISO 4587:

Polycarbonate

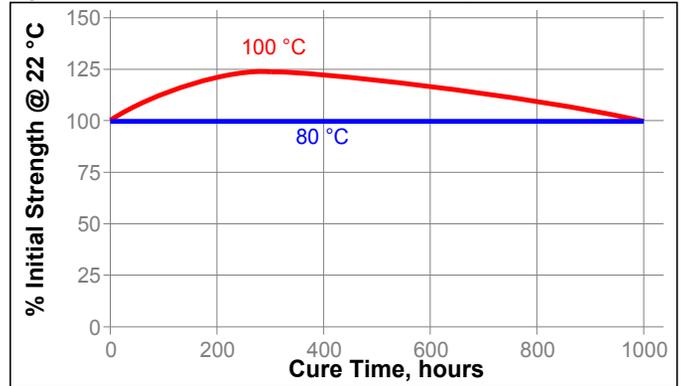
Hot Strength

Tested at temperature



Heat Aging

Aged at temperature indicated and tested @ 22 °C



Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 22 °C.

Environment	°C	% of initial strength		
		100 h	500 h	1000 h
Water	22	100	100	100
95% RH	40	100	100	100

Lap Shear Strength, ISO 4587:

Glass, with Activator 7252™ on 1 side to Polycarbonate, with Activator 7251™ on 1 side

Environment	°C	% of initial strength		
		100 h	500 h	1000 h
Water	22	80	80	80
95% RH	40	80	80	80

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).

Where aqueous washing systems are used to clean the surfaces before bonding, it is important to check for compatibility of the washing solution with the adhesive. In some cases these aqueous washes can affect the cure and performance of the adhesive.

Directions for use

1. LOCTITE® 3951™ should be applied as a bead to one surface.
2. When joint is assembled pressure should be applied to spread the adhesive out and fill the joint completely.
3. The bond should be allowed to cure (e.g. seven days), before subjecting to heavy service loads.
4. For metal joints, the bond should be allowed to cure fully for up to 10 days.
5. For best adhesion and durability it is recommended to use LOCTITE® polyurethane activators as appropriate (see appropriate TDS for details on usage)
 - For plastics and wood use Activator 7251™
 - For glass use Cleaner 7210™ and Activator 7252™
 - For metals use Activator 7253™.

Loctite Material Specification^{LMS}

LMS dated October 16, 1995. 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: 8 °C to 21 °C. Storage below 8 °C or greater than 28 °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

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Reference 1.0