



LOCTITE[®] 331[™]

March 2008

PRODUCT DESCRIPTION

LOCTITE[®] 331[™] provides the following product characteristics:

Technology	Acrylic
Chemical Type	Modified acrylic
Appearance (uncured)	light yellow to sand yellow paste ^{LMS}
Components	One component - requires no mixing
Viscosity	Medium
Cure	Activator
Secondary Cure	Heat
Application	Bonding
Specific Benefit	<ul style="list-style-type: none"> • Non-corrosive. • Rapid room temperature cure. • High temperature resistance. • High shear & impact strength.

LOCTITE[®] 331[™] is a toughened acrylic adhesive with medium viscosity. This adhesive is designed for bonding metal substrates and is well suited for DC motor assembly, magnet bonding, and bonding of pre-coated sheet metal. The cured product provides high shear and impact strength with excellent environmental and chemical resistance.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.1
Flash Point - See MSDS	
Viscosity, Cone & Plate, mPa·s (cP):	
PHYSICA MK22 @ 5 s-1	8,000 to 30,000 ^{LMS}

TYPICAL CURING PERFORMANCE

LOCTITE[®] 331[™] is designed to be used with Activator 7387[™] and cured at room temperature. Cure characteristics are measured by determining fixture time (handling time) and speed of cure.

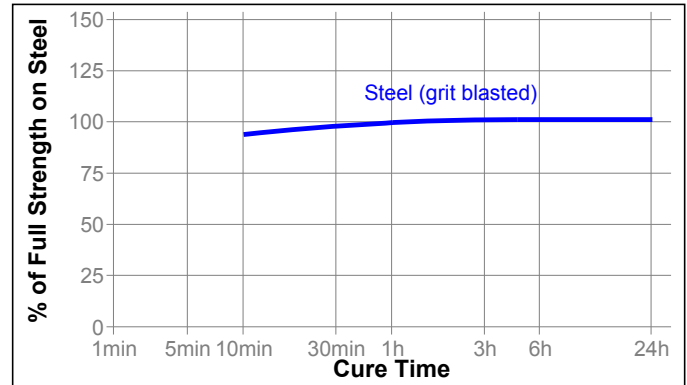
Fixture Time

Fixture time is defined as the time to develop a shear strength of 0.1 N/mm².

Fixture Time, ISO 4587, seconds:	
Grit Blasted Mild Steel, with Activator 7387 [™] on 1 side:	
with 0.05 mm gap	15 to 20
0.127 mm gap	60 to 75
0.25 mm gap	135 to 150

Cure Speed vs. Substrate

The graph below shows the shear strength developed with time on grit blasted steel lap shears and tested according to ISO 4587 (Activator 7387[™] applied to one surface).



TYPICAL PROPERTIES OF CURED MATERIAL

Cured for 48 hours @ 25 °C followed by 3 hours @ 80 °C, tested @ 25 °C

Physical Properties:

Glass Transition Temperature (Tg) by TMA, °C	64
Shore Hardness, ISO 868, Durometer D	86
Water Absorption, ISO 62, %:	
2 hours in boiling water	0.78
Linear Shrinkage, ISO 1675 %	2.4
Volume Shrinkage, ISO 1675 %	7.1
Elongation, at break, ISO 527-3, %	3.0
Tensile Strength, at break, ISO 527-3	N/mm ² 11 (psi) (1,590)
Tensile Modulus, ISO 527-3	N/mm ² 900 (psi) (130,000)

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 24 hours @ 25 °C, Activator 7387[™] on 1 side

Lap Shear Strength, ISO 4587:

Steel :	
0.05 mm gap	N/mm ² ≥13.8 ^{LMS} (psi) (≥2,000)

Cured for 48 hours @ 25 °C, Activator 7387[™] on 1 side

Lap Shear Strength, ISO 4587:

Steel (grit blasted):	
0.127 mm gap	N/mm ² 17 (psi) (2,530)

Steel (grit blasted):	
0.25 mm gap	N/mm ² 14 (psi) (2,030)



Steel (grit blasted): 0.38 mm gap	N/mm ² (psi)	11 (1,620)
180° Peel Strength, ISO 8510-2: Steel (grit blasted)	N/mm (lb/in)	3.3 (19)
"T" Peel Strength, ISO 11339: Aluminum (grit blasted)	N/mm (lb/in)	1.7 (10)

Cured for 48 hours @ 25 °C, Activator 7387™ on 2 sides
Lap Shear Strength, ISO 4587:

Steel (grit blasted): 0.127 mm gap	N/mm ² (psi)	21 (3,030)
Steel (grit blasted): 0.25 mm gap	N/mm ² (psi)	18 (2,690)
Steel (grit blasted): 0.38 mm gap	N/mm ² (psi)	16 (2,350)
Block Shear Strength, ISO 13445: Ferrite Magnet to Mild steel: 0.05 mm gap	N/mm ² (psi)	12 (1,720)
Impact Strength, ISO 9653, J: Ferrite Magnet to Mild steel		2.3

TYPICAL ENVIRONMENTAL RESISTANCE

Cured for 48 hours @ 22 °C, Activator 7387™ on 1 side
Lap Shear Strength, ISO 4587:
Steel (grit blasted)

Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 22 °C.

Environment	°C	% of initial strength	
		250 h	500 h
95% RH	40	98	70
85% RH	85	95	66
Motor oil	87	-----	143
Air	87	-----	135
ATF	87	-----	130
Water/glycol 50/50	87	-----	83
Isopropanol	22	-----	96

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.

This product is not normally recommended for use on plastics (particularly thermoplastic materials where stress cracking of the plastic could result). Users are recommended to confirm compatibility of the product with such substrates.

Directions for use

1. For best performance bond surfaces should be clean and free from grease and other contaminants.
2. Activator 7387™ should be applied to one of the bond surfaces and the adhesive to the other surface. Parts should be assembled within two hours. Minimizing the on-part time of the activator maximizes the consistency of performance.
3. Where bond gaps are large (up to a maximum of 0.5 mm), or faster cure speed is required, Activator 7387™ should be applied to both surfaces. Parts should be assembled immediately.
4. Excess adhesive can be wiped away with organic solvent.
5. Bond should be held clamped until adhesive has fixtured.
6. Product should be allowed to develop full strength before subjecting to any service loads (typically 24 to 72 hours after assembly, depending on bond gap, materials and ambient conditions).

Loctite Material Specification^{LMS}

LMS dated July 16, 2007. 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 0.1