



LOCTITE[®] A-533[™]

June 2010

PRODUCT DESCRIPTION

LOCTITE[®] A-533[™] provides the following product characteristics:

Technology	Acrylic
Chemical Type	Acrylate
Appearance	Light blue to gray ^{LMS}
Viscosity	Thixotropic
Cure	Activator
Components	One component - requires no mixing
Solids Content	100%
Product Benefits	<ul style="list-style-type: none"> • Environmentally friendly • Non-drip rheology • Rapid room temperature cure • Excellent adhesion to magnet & metal surfaces
Operating Temperature	-65 to 163 °C
Application	Bonding

LOCTITE[®] A-533[™] is a rapid curing surface-activated acrylic adhesive that is used in conjunction with an activator. This adhesive is nonflammable, 100% solids, and has a lower odor when compared to other acrylic adhesives. LOCTITE[®] A-533[™] cures rapidly at room temperature, fixturing parts in 15 to 30 seconds. LOCTITE[®] A-533[™] was designed specifically for the bonding of magnets and provides excellent adhesion to ferrite, alnico, and rare earth magnet types. Excellent bond strength is also obtained to most metal surfaces. LOCTITE[®] A-533[™] retains bond strength, and will not be degraded by short-term 20 to 30 minutes exposure to high temperatures, 232°C. This type of temperature cycle is typically observed in paint ovens. Typical applications include permanent magnet brush in type DC motors, permanent magnet brushless motors, speakers, generators, flywheels, sensors, structural metal and glass bonding, furniture, elevators, automotive, and appliances.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.1
Viscosity, Brookfield - RVF, 25 °C, mPa·s (cP):	
Spindle 6, speed 20 rpm	10,000 to 20,000 ^{LMS}

Flash Point - See MSDS

TYPICAL CURING PERFORMANCE

Fixture Time

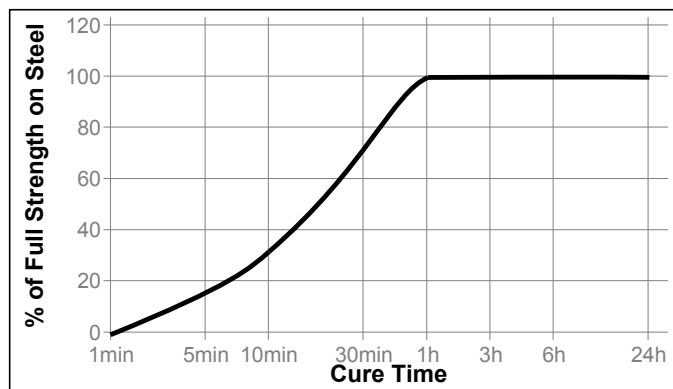
Fixture time is defined as the time to develop a shear strength of 0.1 N/mm².

Fixture Time, ISO 4587, seconds:

Grit Blasted Mild Steel, with Activator A-534R [™] on 1 side:	≤30 ^{LMS}
0.05 mm gap	15 to 30
0.127 mm gap	30 to 60
0.254 mm gap	120 to 180

Cure Speed vs. Time

The graph below shows the shear strength developed over time at 22 °C / 50 % RH on Mild Steel (degreased) and tested according to ISO 4587.



TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties:

Shore Hardness, ISO 868, Durometer D:	
@ 25 °C	60 to 65

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 15 minutes @ 25 °C, with Activator A-534R[™] on 1 side

Lap Shear Strength, ISO 4587:	
Steel	N/mm ² ≥8.3 ^{LMS} (psi) (≥1,203)

Cured for 24 hours @ 25 °C, with Activator A-534R[™] on 1 side

Lap Shear Strength, ISO 4587:	
Steel	N/mm ² ≥13.8 ^{LMS} (psi) (≥2,000)
Aluminum	N/mm ² 21 (psi) (3,000)
Galvanized Steel	N/mm ² 14 (psi) (2,000)



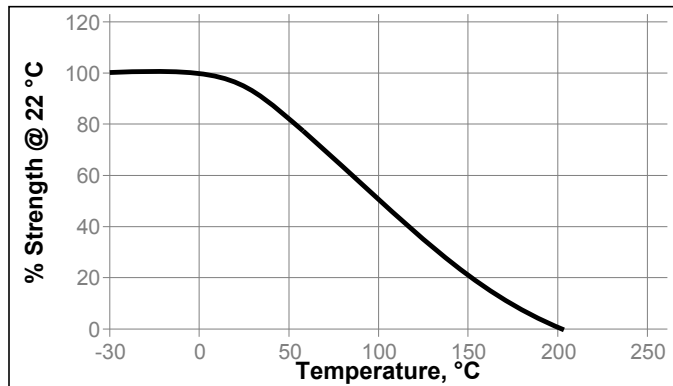
Stainless steel	N/mm ²	24
	(psi)	(3,500)
Zinc plated steel	N/mm ²	21
	(psi)	(3,000)
Ferrite Magnet to Steel	N/mm ²	>14
	(psi)	(>2,000)
Ferrite Magnet to Zinc dichromate	N/mm ²	>14
	(psi)	(>2,000)
Ferrite Magnet to Galvanized Steel	N/mm ²	>14
	(psi)	(>2,000)
Ferrite Magnet to Zinc plated	N/mm ²	>14
	(psi)	(>2,000)
Glass	N/mm ²	>1.7
	(psi)	(>250)
Impact Strength, ISO 9653, J: Steel		20
"T" Peel Strength, ISO 11339: Steel	N/mm (lb/in)	3.5 to 4.4 (20 to 25)

TYPICAL ENVIRONMENTAL RESISTANCE

Cured for 72 hours @ 22 °C, with Activator A-534R™ on 1 side

Lap Shear Strength, ISO 4587:
Mild Steel (degreased)

Hot Strength



Heat Aging

Aged at temperature indicated and tested @ 22 °C

Temperature, °C	% of initial strength	
	500h	1000h
Mild Steel, (degreased)		
150	74	75

Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 22 °C.

Environment	°C	% of initial strength	
		500 h	1000 h
Salt fog, 5% salt, Ferrite / Steel	38	100	100
Salt fog, 5% salt, Ferrite / Zinc Dichromate	38	100	100
Salt fog, 5% salt, Steel / Steel	38	77	75
100%RH on Glass	38	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 oxidizing materials

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

Directions for use:

1. Surface Preparation:

- LOCTITE® A-533™ bonds well to many unprepared metal surfaces. For optimum bond strength on metal parts the surface should be washed with a solvent or cleansing solution, abraded with an abrasive pad, and then rinsed with a solvent or cleansing solution. Glass surfaces should be cleaned with a residue free glass cleaner before bonding. Painted surfaces should be abraded lightly and then wiped clean.

2. Application Method:

- Apply a thin layer of Activator A-534R™ by spraying, wiping, or brushing onto one of the bonding surfaces.
- Apply LOCTITE® A-533™ to the bond area on the non-activated bonding surface.
- Parts should be clamped for 15 to 30 seconds or until handling strength is obtained.

Loctite Material Specification^{LMS}

LMS dated January 15, 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

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Reference 0.1