

Technical Data Sheet

LOCTITE[®] AA A-533™

Known as LOCTITE[®] A-533™ December 2013

PRODUCT DESCRIPTION

LOCTITE[®] AA 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	Environmentally friendly		
	 Non-drip rheology 		
	 Rapid room temperature cure 		
	• Excellent adhesion to magnet &		
	metal surfaces		
Operating Temperature	-65 to 163 °C		
Application	Bonding		

LOCTITE[®] AA 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[®] AA A-533[™] cures rapidly at room temperature, fixturing parts in 15 to 30 seconds. LOCTITE[®] AA 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[®] AA 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 SDS	

TYPICAL CURING PERFORMANCE

Fixture Time

Fixture time is defined as the time to develop a shear strength of 0.1 N/mm^2 .

Fixture Time, ISO 4587, seconds:

Grit Blasted Mild Steel, with Activator A-534R[™] on 1 side:

	≤30
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 $^\circ\text{C}$ / 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 $^\circ\text{C},$ with Activator A-534R^ $^{\rm TM}$ on 1 side

Lap Shear Strength, ISO 4587:		
Steel	N/mm²	≥8.3 ^{LMS}
	(psi)	(≥1,203)

Cured for 24 hours @ 25 $^\circ\text{C}, \ \text{with Activator A-534R}^{\,\text{\scriptsize IM}} \ \text{on 1}$ side

Lap Shear Strength, ISO 4587:

Steel	N/mm *	213.8
	(psi)	(≥2,000)
Aluminum	N/mm²	21
	(psi)	(3,000)
Galvanized Steel	N/mm²	14
	(psi)	(2,000)
Stainless steel	N/mm²	24
	(psi)	(3,500)
Zinc plated steel	N/mm²	21
	(psi)	(3,000)
Ferrite Magnet to Steel	N/mm ²	>14
	(psi)	(>2,000)
Ferrite Magnet to Zinc	N/mm ²	>14
dichromate	(psi)	(>2,000)
Ferrite Magnet to Galvanized	N/mm ²	>14
Steel	(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
		20
"T" Dool Strongth ISO 11330		
etool	NI/mm	2 5 to 1 1
31661	(lb/in)	(20 to 25)
	(ID/III)	(201025)

TYPICAL ENVIRONMENTAL RESISTANCE

Cured for 72 hours @ 22 $^\circ\text{C}, \ \text{with Activator A-534R}^{\,\mbox{\scriptsize M}} \ \ \text{on 1}$ 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		
Mild Steel, (degreased)	500h	1000h	
150	74	75	

Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 22 °C.

		% of initial strength	
Environment	°C	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 Safety Data Sheet (SDS).

Directions for use:

- 1. Surface Preparation:
 - LOCTITE[®] AA 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:

- 1. Apply a thin layer of Activator A-534R[™] by spraying, wiping, or brushing onto one of the bonding surfaces.
- 2. Apply LOCTITE[®] AA A-533[™] to the bond area on the non-activated bonding surface.
- 3. 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.

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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

 $(^{\circ}C \ge 1.8) + 32 = ^{\circ}F$ kV/mm $\ge 25.4 =$ V/mil mm / 25.4 = inches μ m / 25.4 = mil N $\ge 0.225 =$ lb N/mm $\ge 5.71 =$ lb/in N/mm² $\ge 145 =$ psi MPa $\ge 145 =$ psi N·m $\ge 8.851 =$ lb·in N·m $\ge 0.738 =$ lb·ft N·mm $\ge 0.738 =$ lb·ft N·mm $\ge 0.142 =$ oz·in mPa $\le = cP$

Note:

The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. The product can have a variety of different applications as well as differing application and working conditions in your environment that are beyond our control. Henkel is, therefore, not liable for the suitability of our product for the production processes and conditions and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product.

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Reference 0.2