LOCTITE® 3060™

February 2010

PRODUCT DESCRIPTION

LOCTITE® 3060™ provides the following product characteristics:

Technology	Acrylic
Chemical Type	Methacrylate
Appearance (Part A)	Off-white to yellow liquid[LMS]
Appearance (Part B)	Green to blue green liquid[LMS]
Appearance (Mixed)	Green/Blue
Viscosity	Thixotropic
Cure	Room temperature cure
Components	Two component - requires mixing
Mix Ratio - Part A:Part B	1 : 1
Solids Content	100%
Application	Bonding

LOCTITE® 3060™ is an externally mixed two-component methacrylate adhesive system designed for structural bonding of magnets in the assemby of fractional horsepower electric motors. This product may also be used for structural bonding of metals. Typical applications include bonding ferrite and rare earth magnets to metal rotors and stators as well as structural bonding of metals.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Part A:

Specific Gravity @ 25 °C	1.1
Viscosity, Cone & Plate, 25 °C, mPa·s (cP):	
Cone CP50-1 @ shear rate 1 s^{-1}	18,000 to 45,000[LMS]
Viscosity, Cone & Plate, 25 °C, mPa·s (cP):	
Cone CP50-1 @ shear rate 10 s^{-1}	6,500 to 15,000[LMS]

Flash Point - See MSDS

Part B:

Specific Gravity @ 25 °C	1.09
Viscosity, Cone & Plate, 25 °C, mPa·s (cP):	
Cone CP50-1 @ shear rate 1 s^{-1}	5,600 to 18,000[LMS]
Viscosity, Cone & Plate, 25 °C, mPa·s (cP):	
Cone CP50-1 @ shear rate 10 s^{-1}	2,000 to 8,600[LMS]

Flash Point - See MSDS

Mixed:

Specific Gravity @ 25 °C	1.1
Open Time @ 22 °C, seconds	≤150

TYPICAL CURING PERFORMANCE

Fixture Time

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

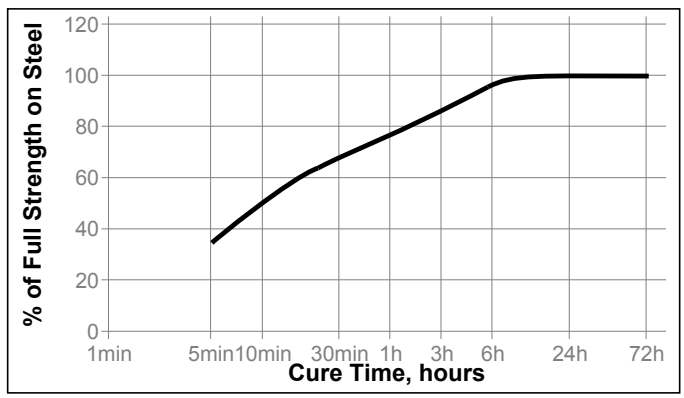
Fixture Time, ISO 4587, seconds:	
Steel, as received	30 to 120[LMS]
Fixture Time, ISO 4587, seconds:	
Steel (grit blasted) to Ferrite	45
Mild steel to Mild steel	50
Aluminum to Aluminum	60
Steel (grit blasted) to Steel (grit blasted):	
0.05 mm gap	30
0.25 mm gap	45

Peak Exotherm Temperature

Peak Exotherm Temperature, 10 gram mass:	
Peak Temperature Time, seconds	140
Peak Temperature, °C	95

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:

Glass Transition Temperature (Tg), °C	104	
Shore Hardness, ISO 868, Durometer D:		
@ 25 °C	77	
Coefficient of Thermal Expansion, ISO 11359-2 K^{-1}:		
Pre Tg	101×10^{-6}	
Post Tg	163×10^{-6}	
Linear Shrinkage, %	2.0	
Volume Shrinkage, %	6.0	
Elongation, at break, ISO 527-3, %	6.4	
Tensile Strength, at break, ISO 527-3	N/mm²	36
	(psi)	(5,330)

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 48 hours @ 25 °C

Impact Strength, ISO 9653, J:

Steel (grit blasted) to Steel (grit blasted)	>13.5
Steel (grit blasted) to AlNiCo	>13.5

Shear Strength:

Lap Shear Strength, ISO 4587:

Steel (grit blasted)	N/mm²	29
	(psi)	(4,270)
Aluminum (abraded)	N/mm²	18
	(psi)	(2,660)
Anodized Aluminum	N/mm²	17
	(psi)	(2,480)
Stainless steel	N/mm²	19
	(psi)	(2,810)
Zinc Galvanized	N/mm²	6
	(psi)	(900)
Zinc dichromate	N/mm²	10
	(psi)	(1,460)
Nylon	N/mm²	1.6
	(psi)	(240)
Steel (grit blasted) to Ferrite	N/mm²	13
	(psi)	(1,830)
Steel (grit blasted) to AlNiCo	N/mm²	18
	(psi)	(2,700)
Steel (grit blasted) to Neodymium	N/mm²	15
	(psi)	(2,200)
Steel (grit blasted) to Samarium Cobalt	N/mm²	8
	(psi)	(1,230)

Block Shear Strength, ISO 13445:

PVC	N/mm²	0.7
	(psi)	(110)
ABS	N/mm²	0.3
	(psi)	(50)
Epoxy	N/mm²	2.7
	(psi)	(400)
Acrylic	N/mm²	0.5
	(psi)	(70)
Glass	N/mm²	8.8
	(psi)	(1,275)

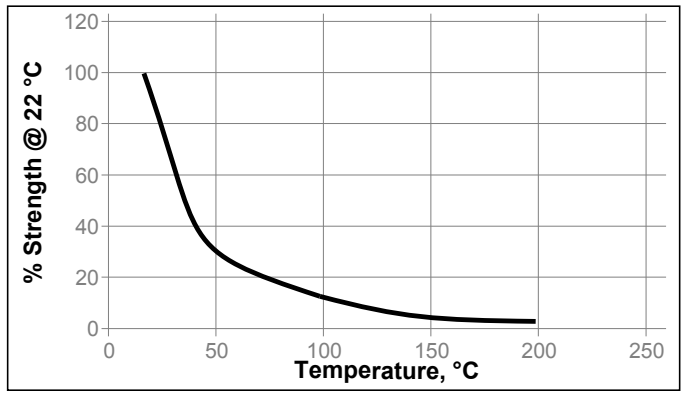
TYPICAL ENVIRONMENTAL RESISTANCE

Cured for 48 hours @ 22 °C

Lap Shear Strength, ISO 4587:

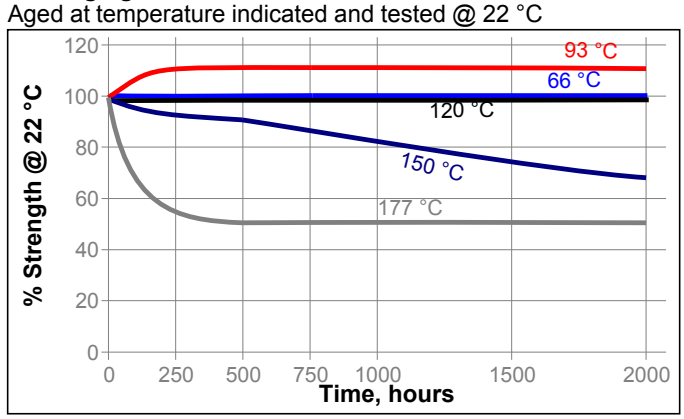
Steel (grit blasted)

Hot Strength



Heat Aging

Aged at temperature indicated and tested @ 22 °C



Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 22 °C.

		% of initial strength	
Environment	**°C**	**500 h**	**1000 h**
Air	87	100	100
Motor oil (10W30)	87	100	100
Unleaded gasoline	87	30	30
Water/glycol	87	65	55
Water immersion	22	70	70
Acetone	22	75	30
Isopropanol	22	90	90
Diesel fuel	22	100	100
Salt fog	22	70	60
Condensing Humidity	49	50	50
95% RH	38	90	90
85% RH	85	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. For high strength structural bonds, remove surface contaminants such as paint, oxide films, oils, dust, mold release agents and all other surface contaminants.
2. Use gloves to minimize skin contact. DO NOT use solvents for cleaning hands.
3. **Bulk Containers:** Normally material is dispensed through an external mix dispensing system. This system consists of two dispense tips that are closely positioned approximately 1.6 mm apart such that when product is dispensed, the two components mix in the air as the adhesive falls on the part. Minimum height of the dispense tips above the part is 15 cm, with best results achieved when a height of 30 cm is used. Optimal dispense angle (from horizontal) of dispense value is 60°. The product will cure when the mix ratio is between 1:2 and 2:1 parts A:B. However, the varying the mix ratio from 1:1 may affect cure speed and ultimate strength and should be verified.
4. Static mix tips are not needed to adequately mix this class of material.
5. Application to the substrates should be made as soon as possible. Larger quantities and/or higher temperatures will reduce the working time.
6. Join the adhesive coated surfaces and allow to cure. Higher temperatures will speed up curing.
7. Keep assembled parts from moving during cure. The bond should be allowed to develop full strength before subjecting to any service load.
8. Excessive uncured adhesive can be cleaned up with ketone type solvents.

Loctite Material Specification[LMS]

LMS dated April 03, 2008 (Part A) and LMS dated January 16, 2008 (Part B). 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 Loctite Quality.

Storage

The product is classified as flammable and must be stored in an appropriate manner in compliance with relevant regulations. Do not store near oxidizing agents or combustible materials. Store product in the unopened container in a dry location. Storage information may also be indicated on the product container labelling.

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 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 Representive.

Conversions

(°C x 1.8) + 32 = °F
kV/mm x 25.4 = V/mil
mm / 25.4 = inches
µm / 25.4 = mil
N x 0.225 = lb
N/mm x 5.71 = lb/in
N/mm² x 145 = psi
MPa x 145 = psi
N·m x 8.851 = lb·in
N·m x 0.738 = lb·ft
N·mm x 0.142 = oz·in
mPa·s = cP

Note

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Reference 0.0