LOCTITE® 3050™

May 2009

PRODUCT DESCRIPTION

LOCTITE® 3050™ provides the following product characteristics:

Technology	Acrylic
Chemical Type	Methacrylate
Appearance (Part A)	Translucent light yellow liquid
Appearance (Part B)	Translucent light yellow to amber liquid
Appearance (Mixed)	Light yellow, Opaque creamy yellow LMS
Components	Two component - requires mixing
Mix Ratio, by volume - Part A: Part B	2 : 1
Cure	Room temperature cure
Application	Bonding

LOCTITE® 3050™ is weld-through capable, high temperature, acid resistant two-component acrylic adhesive system designed for weld/rivet reduction. The product cures very rapidly forming tough, durable bonds. LOCTITE® 3050™ exhibits high resistance to phosphate and autophoretic metal treatment processes. Once statically mixed, the two component acrylic cures at room temperature. Typical applications include the agriculture, construction, and specialty vehicle markets.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Part A:

Specific Gravity @ 25 °C 1.0

Flash Point - See MSDS

Viscosity, Cone & Plate, 25 °C, mPa·s (cP):

Cone CP50-1 @ shear rate 20 min^{-1} 15,000 to 50,000 LMS

Part B:

Specific Gravity @ 25 °C 0.97

Flash Point - See MSDS

Viscosity, Cone & Plate, 25 °C, mPa·s (cP):

Cone CP50-1 @ shear rate 50 min^{-1} 15,000 to 40,000 LMS

Mixed:

Specific Gravity @ 25 °C 1.0

Flash Point - See MSDS

Working Time @ 25 °C, minutes (maximum time before assembly):

Polyethylene	11
Steel	15
Aluminum	13

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:

Aluminum	60 to 75
Polycarbonate	75 to 90

Fixture Time, ISO 4587, minutes:

Grit Blasted Mild Steel	15 to 20

Peak Exotherm Temperature

Peak Exotherm Temperature, 10 gram mass:

Peak Temperature Time, minutes	11
Peak Temperature, °C	111

TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties:

Glass Transition Temperature (Tg), ISO 11359-2, °C		172
Coefficient of Thermal Expansion, ISO 11359-2, K^{-1}:		
Pre Tg		100×10^{-6}
Shore Hardness, ISO 868, Durometer D		75
Linear Shrinkage, ISO 1675, %		2.8
Volume Shrinkage, ISO 1675, %		8.3
Elongation, at break, ISO 527-2, %		7
Tensile Strength, at yield, ISO 527-2	N/mm² (psi)	20 (2,890)
Tensile Modulus, ISO 527-2	N/mm² (psi)	1,590 (230,600)

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 24 hours @ 22 °C

Lap Shear Strength, ISO 4587:

Steel	N/mm² (psi)	≥11.5 LMS (≥1,667)

Cured for 72 hours @ 22 °C.

Impact Strength, ISO 9653, J:

Grit Blasted Mild Steel (GBMS)	>14
Aluminum (abraded)	12
FRP	4

"T" Peel Strength, ISO 11339:

Steel	N/mm	1.2
	(lb/in)	(7)
Aluminum	N/mm	0.17
	(lb/in)	(1)

Block Shear Strength, ISO 13445:

Ferrite Magnet to Steel	N/mm²	17
	(psi)	(2,420)

Lap Shear Strength, ISO 4587:

Grit Blasted Mild Steel (GBMS)	N/mm²	23
	(psi)	(3,290)
Aluminum	N/mm²	19
	(psi)	(2,730)
Stainless Steel	N/mm²	21
	(psi)	(3,100)
Galvanized Steel	N/mm²	17
	(psi)	(2,420)
FRP	N/mm²	3.3
	(psi)	(485)
Gelcoat (anodised)	N/mm²	5
	(psi)	(730)
Polycarbonate	N/mm²	1.2
	(psi)	(180)
PVC	N/mm²	1.4
	(psi)	(200)
ABS	N/mm²	1.1
	(psi)	(160)
Epoxy	N/mm²	4.5
	(psi)	(660)
Acrylic	N/mm²	1
	(psi)	(140)
Glass	N/mm²	1.9
	(psi)	(270)

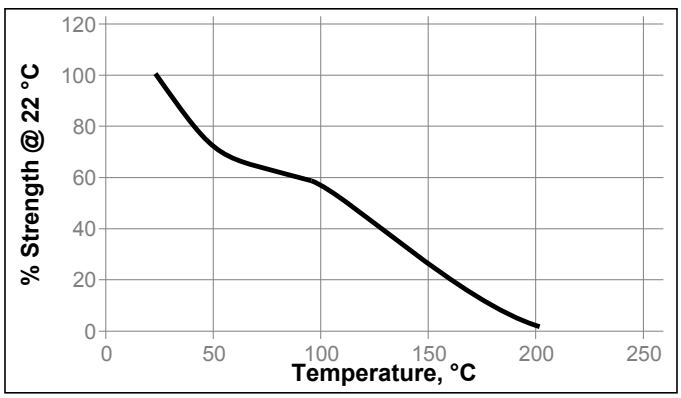
TYPICAL ENVIRONMENTAL RESISTANCE

Cured for 72 hours @ 22 °C

Lap Shear Strength, ISO 4587:

Grit Blasted Mild Steel (GBMS)

Hot Strength



Heat Aging

Aged at temperature indicated and tested @ 22 °C

Temperature, °C	% of initial strength	
GBMS	**500h**	**1000h**
100	85	85
177	100	90
205	100	100
Aluminum	**500h**	**1000h**
100	70	70
177	85	85
205	90	80
Galvanized Steel	**500h**	**1000h**
100	60	60
177	45	45
205	54	45

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	90	70
Unleaded gasoline	87	20	15
Water/glycol 50/50	87	100	80
Water	22	100	75
Acetone	22	30	15
Isopropanol	22	95	100
95% RH	40	110	110
100% RH	49	100	100
Salt fog	22	80	80
Salt Fog on Al	38	100	100
Salt Fog on Galvanized Steel	38	70	70
100%RH on Al	49	100	100
100%RH on Galvanized Steel	49	100	100

Resistance to Metal Pre-treatment Processes

As received steel assemblies were mated with adhesive, immediately spot welded and then subjected to the following processes within 20 minutes of spot welding. After exposure to the processes, bonded assemblies were allowed to cure for at least 24 hours and then tested for shear strength at 22°C. Assemblies which were only spot welded yielded shear strengths of 810 PSI, 5.6 N/mm² .

Lap Shear Strength, ISO 4587:

Phosphate (e-coated), at 204°C for 10 minutes	N/mm²	20
	(psi)	(2,850)
Phosphate (e-coated), at 232°C for 40 minutes	N/mm²	18
	(psi)	(2,600)

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. **Dual Cartridges:** To begin using a new cartridge, remove cartridge cap and dispense a small amount of adhesive, making sure both parts A&B are extruding. Attach nozzle and dispense approximately 25 to 50mm, before applying onto part to be bonded. Partially used cartridges can be stored with the mixing nozzle attached. To reuse, remove and discard old nozzle, attach the new nozzle, dispense approximately 25 to 50mm, before applying onto part to be bonded.
   Bulk Containers: Normally material is dispensed through volumetric metered mixing equipment, attached to static mix nozzles
4. For maximum bond strength apply adhesive evenly to both surfaces to be joined
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 August 07, 2007 (Part A) and LMS dated August 15 , 2007 (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

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

(°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

The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof. In light of the foregoing, **Henkel Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel Corporation specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits.** The discussion herein of various processes or compositions is not to be interpreted as representation that they are free from domination of patents owned by others or as a license under any Henkel Corporation patents that may cover such processes or compositions. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide. This product may be covered by one or more United States or foreign patents or patent applications.

Trademark usage

Reference 0.2