LOCTITE® V5004™

March 2011

PRODUCT DESCRIPTION

LOCTITE® V5004™ provides the following product characteristics:

Technology	Acrylic
Chemical Type	Acrylic
Appearance, Resin (Component A)	Light blue, slightly opaque[LMS]
Appearance, Hardener (Component B)	Light pink, clear[LMS]
Components	Two component - requires mixing
Viscosity	Medium, thixotropic
Cure	Two part acrylic
Mix Ratio, by volume - Part A: Part B	1 : 1
Application	Bonding
Specific Benefit	• Fast, room temperature cure • Clear bond lines • well suited for bonding clear plastics • Excellent adhesion to plastics & metals • Durable • High peel & impact strength

LOCTITE® V5004™ is a structural acrylic adhesive that provides toughness and excellent adhesion to plastics, metals and composites. The cured product is virtually transparent making it well suited for bonding applications requiring clear, invisible glue lines. LOCTITE® V5004™ has very high shear strength and resistance to peel, fatigue, and impact loads. This product will adhere to a wide variety of surfaces including most structural thermoplastics, thermosets, FRP, stone, ceramics, steel and aluminum. LOCTITE® V5004™ is useful to join dissimilar materials.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Part A:

Specific Gravity @ 25 °C 1.0

Viscosity, Brookfield - RVF, 25 °C, mPa·s (cP):
Spindle 6, speed 10 rpm 16,000 to 22,000[LMS]

Flash Point - See MSDS

Part B:

Specific Gravity @ 25 °C 1.0

Viscosity, Brookfield - RVF, 25 °C, mPa·s (cP):
Spindle 5, speed 10 rpm 15,000 to 21,000[LMS]

Flash Point - See MSDS

TYPICAL CURING PERFORMANCE

This product cures rapidly when the components are dispensed through a static mixer at room temperature.

Gel Time

Gel time, 25 °C, seconds 45 to 70[LMS]

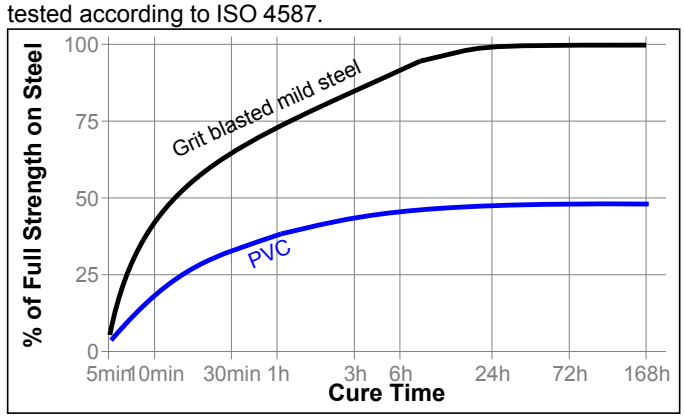
Fixture Time

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

Fixture Time, mixed, minutes:
Grit Blasted Mild Steel (degreased) ≤3[LMS]

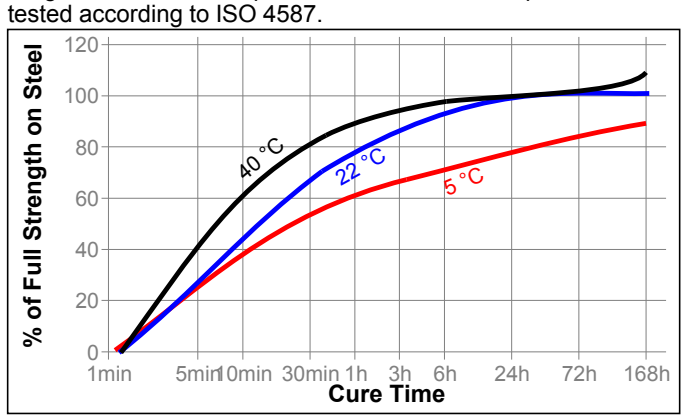
Cure Speed vs. Substrate

The rate of cure will depend on the substrate used. The graph below shows the shear strength developed with time on grit blasted steel lap shears compared to different materials and tested according to ISO 4587.



Cure Speed vs. Temperature

The graph below shows the shear strength developed with time on grit blasted steel lap shears at different temperatures and tested according to ISO 4587.



TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties:

Shore Hardness, ISO 868, Durometer D		59
Glass Transition Temperature (Tg), °C		66
Refractive Index		1.54
Tensile Strength, at break, ISO 527-3	N/mm²	≥12[LMS]
	(psi)	(≥1,740)
Tensile Modulus, ISO 527-3	N/mm²	600
	(psi)	(87,000)
Elongation, at break, ISO 527-3, %		5

Coefficient of Thermal Expansion, ISO 11359-2 K^{-1}:

Pre Tg	176×10^{-6}
Post Tg	207×10^{-6}

Block Shear Strength, ISO 13445:

Polycarbonate	N/mm²	3
	(psi)	(435)
Ferrite Magnet	N/mm²	10.6
	(psi)	(1,540)
Epoxy	N/mm²	11.5
	(psi)	(1,670)
Acrylic	N/mm²	7.4
	(psi)	(1,070)
Glass	N/mm²	9
	(psi)	(1,305)
PVC (grit blasted)	N/mm²	2
	(psi)	(290)
ABS	N/mm²	7
	(psi)	(1,015)

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for >16 hours @ 25 °C

"T" Peel Strength, ISO 11339:

Aluminum (grit blasted)	N/mm	≥4[LMS]
	(lb/in)	(≥22.8)

Cured for 24 hours @ 22 °C

Lap Shear Strength, ISO 4587:

Mild Steel (grit blasted)	N/mm²	21.4
	(psi)	(3,100)
PVC	N/mm²	10.2
	(psi)	(1,480)

Cured for 168 hours @ 22 °C

Lap Shear Strength, ISO 4587:

PVC	N/mm²	9
	(psi)	(1,305)
Stainless steel	N/mm²	16
	(psi)	(2,320)
Aluminum	N/mm²	13
	(psi)	(1,885)
ABS	N/mm²	7.5
	(psi)	(1,090)
Mild steel (grit blasted)	N/mm²	22.5
	(psi)	(3,260)
Polycarbonate	N/mm²	4
	(psi)	(580)
PMMA	N/mm²	7
	(psi)	(1,015)
Galvanized Steel	N/mm²	13
	(psi)	(1,885)
FRP	N/mm²	5.6
	(psi)	(810)
Gelcoat	N/mm²	12
	(psi)	(1,740)

TYPICAL ENVIRONMENTAL RESISTANCE

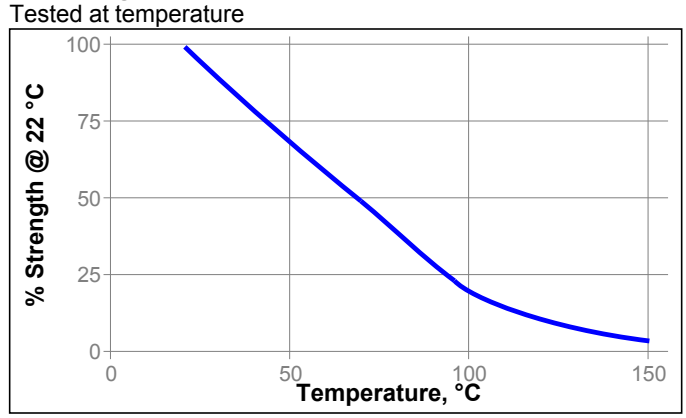
Cured for 24 hours @ 22 °C

Lap Shear Strength, ISO 4587:

Mild steel (grit blasted)

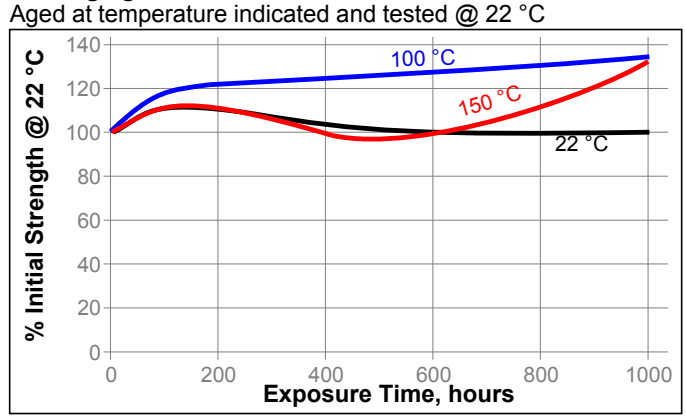
Hot Strength

Tested at temperature



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**	**100 h**	**500 h**	**1000 h**	**3000 h**
Acetone	22	30	------	------	-----
98% RH	40	100	95	80	65
7.5% Salt water solution	22	95	80	80	80
Water	60	120	115	105	105
Water	90	115	110	95	100
Water/glycol 50/50	87	125	110	100	110

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:** Insert the cartridge into the application gun and start the plunger into the cylinders using light pressure on the trigger. Next, remove the cartridge cap and expel a small amount of adhesive to be sure both sides are flowing evenly and freely. Attach the static mixing nozzle to the end of the cartridge and begin dispensing the adhesive. Purge and dispose of the first 3 - 5 cm from the end of the mix nozzle, as it may not be sufficiently mixed.
   Bulk Containers: Utilize volumetric dispense system to ensure proper mix ratio and utilize mix nozzle to obtain adequate mixing.
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.

Clean-up

1. Uncured material may be cleaned from dispenser components and surfaces with a variety of solvents; including LOCTITE® 7360™, LOCTITE® Equipment Flushing Solvent™, IPA, acetone, MEK, methylene chloride, etc. .
2. Removal of material that has been mixed should be done quickly as polymerization occurs rapidly.
3. After use, the static mixer may be used in place of the cap.
4. When the product is reused, a new static mixer must be used.
5. Contact your equipment supplier to ensure that any solvents used are compatible with individual components.

Loctite Material Specification[LMS]
LMS dated October 08, 2010 (Part A) and LMS dated November 05, 2010 (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. Material removed from containers may be contaminated during use. Do not return liquid to original container. 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**. Henkel cannot assume responsibility for product which has been contaminated or stored under conditions other than those recommended. 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

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Reference 0.1