LOCTITE® 3525™

February 2008

PRODUCT DESCRIPTION

LOCTITE® 3525™ provides the following product characteristics:

Technology	Acrylic
Chemical Type	Modified acrylic
Appearance (uncured)	Transparent liquid[LMS]
Fluorescence	Positive under UV light[LMS]
Components	One component - requires no mixing
Viscosity	Medium
Cure	Ultraviolet (UV)/ visible light
Cure Benefit	Production - high speed curing
Application	Bonding

LOCTITE® 3525™ is suitable for bonding a wide variety of materials. Cures fast to form clear, colorless bonds. When cured, it offers excellent flexibility, toughness and durability to moisture exposure. It is used to bond glass, metals and plastics for industrial applications. LOCTITE® 3525™ is suitable for use in electric motor balancing applications.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.08
Refractive Index	1.48
Flash Point - See MSDS	
Viscosity, Brookfield - RVT, 25 °C, mPa·s (cP):	
Spindle 6, speed 20 rpm	9,500 to 21,000[LMS]
Color, APHA	≤250[LMS]

TYPICAL CURING PERFORMANCE

LOCTITE® 3525™ can be cured by exposure to UV and/or visible light of sufficient intensity. The speed and depth of cure will depend on the UV intensity measured at the product surface.

Tack Free Time

Tack Free Time is the time required to achieve a tack free surface

Tack Free Time, seconds:	
Zeta® 7200:	
50 mW/cm² , measured @ 365 nm	10 to 15
Tack Free Time, minutes:	
Zeta® 7400:	
50 mW/cm² , measured @ 365 nm	>5

Fixture Time

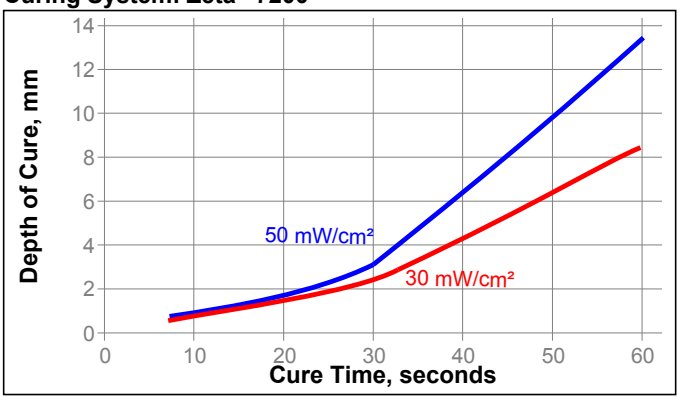
Fixture time is defined as the time to develop a shear strength of 0.1 N/mm² .

UV Fixture Time, Glass microscope slides, seconds:	
Black light, Zeta® 7500 light source:	
6 mW/cm² , measured @ 365 nm	≤5[LMS]

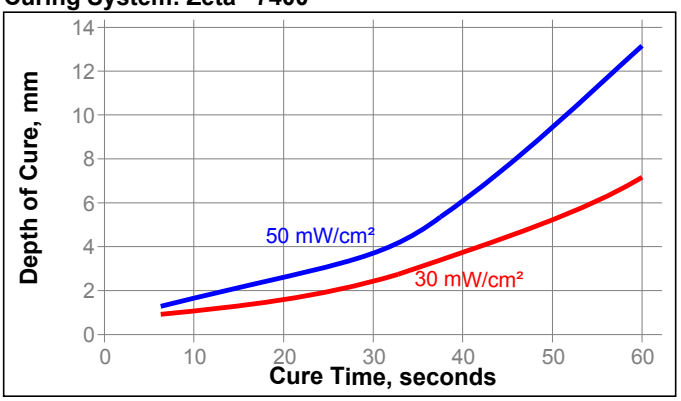
Depth of Cure vs. Irradiance (365 nm)

Cure depth depends both on external factors including the type of light source, light intensity and exposure time and on internal factors including composition of the adhesive . The following graphs show the effect of light source, light intensity and exposure time on depth of cure for LOCTITE® 3525™.

Curing System: Zeta® 7200



Curing System: Zeta® 7400



TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties

Coefficient of Thermal Expansion, ISO 11359-2, K^{-1}		4.8×10^{-4}
Glass Transition Temperature, ISO 11359-2, °C:		
(Tg) by TMA		43
Shore Hardness, ISO 868, Durometer D		60
Refractive Index, ASTM D542		1.51
Elongation, ISO 527-3, %		260
Tensile Strength, at break, ISO 527-3	N/mm^2	24
	(psi)	(3,500)
Tensile Modulus, ISO 527-3	N/mm^2	175
	(psi)	(25,000)

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured @ 50 mW/cm² , measured @ 365 nm, for 30 secondsusing a Zeta® 7200 light source

135° Peel Strength:

20 mesh stainless steel screen to Glass	N/mm	2.3
	(lb/in)	(13)

Torsional Shear Strength, ASTM D 3658:

Aluminum hex button to Glass	N·m	≥70[LMS]
	(lb·ft)	(≥51.6)

Lap Shear Strength, ISO 4587:

Glass:		
0 gap	N/mm^2	4.7
	(psi)	(700)
0.5 mm gap	N/mm^2	5
	(psi)	(725)

Block Shear Strength, ISO 13445:

ABS to Glass	N/mm^2	3.6
	(psi)	(520)
Acrylic to Glass	N/mm^2	4.3
	(psi)	(630)
Aluminum to Glass	N/mm^2	9.8
	(psi)	(1,420)
G-10 Epoxyglass to Glass	N/mm^2	8.6
	(psi)	(1,250)
Polycarbonate to Glass	N/mm^2	7.7
	(psi)	(1,110)
PVC to Glass	N/mm^2	7.1
	(psi)	(1,030)
Steel to Glass	N/mm^2	10.2
	(psi)	(1,480)

TYPICAL ENVIRONMENTAL RESISTANCE

Cured @ 50 mW/cm² , measured @ 365 nm, for 30 secondsusing a Zeta® 7200 light source

Humidity Resistance

Aged @ 49°C / condensing humidity and tested @ 22 °C

Block Shear Strength, ISO 13445, % of initial strength:

ABS to Glass:	
Aged 2 weeks	120
Aged 4 weeks	115
Acrylic to Glass:	
Aged 2 weeks	100
Aged 4 weeks	85
Aluminum to Glass:	
Aged 2 weeks	90
Aged 4 weeks	95
G-10 Epoxyglass to Glass:	
Aged 2 weeks	120
Aged 4 weeks	130
Polycarbonate to Glass:	
Aged 2 weeks	60
Aged 4 weeks	50
PVC to Glass:	
Aged 2 weeks	135
Aged 4 weeks	100
Steel to Glass:	
Aged 2 weeks	65
Aged 4 weeks	65

Lap Shear Strength, ISO 4587, % of initial strength:

Glass :	
Aged 2 weeks:	
0 gap	125
0.5 mm gap	115
Aged 4 weeks:	
0 gap	105
0.5 mm gap	100

Torsional Shear Strength, ASTM D 3658, % of initial strength:

Aluminum hex button to Glass:	
Aged 2 weeks	70
Aged 4 weeks	65
Aged 6 weeks	65

Aged @ 121°C and tested @ 22 °C

Torsional Shear Strength, ASTM D 3658, % of initial strength:

Aluminum hex button to Glass:	
Aged 2 weeks	105
Aged 4 weeks	105
Aged 6 weeks	115

Aged @ 149°C and tested @ 22 °C

Torsional Shear Strength, ASTM D 3658, % of initial strength:

Aluminum hex button to Glass:	
Aged 2 weeks	85
Aged 4 weeks	85
Aged 6 weeks	80

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. This product is light sensitive; exposure to daylight, UV light and artificial lighting should be kept to a minimum during storage and handling.

2. The product should be dispensed from applicators with black feedlines.
3. For best performance bond surfaces should be clean and free from grease.
4. Cure rate is dependent on lamp intensity, distance from light source, depth of cure needed or bondline gap and light transmittance of the substrate through which the radiation must pass.
5. Full cure is estimated to be four to five times the fixture time.
6. For dry curing of exposed surfaces, mercury arc () or Electrodeless system, D or H bulbs are recommended.
7. Cooling should be provided for temperature sensitive substrates such as thermoplastics.
8. Plastic grades should be checked for risk of stress cracking when exposed to liquid adhesive.
9. Excess uncured adhesive can be wiped away with organic solvent (e.g. Acetone).
10. Bonds should be allowed to cool before subjecting to any service loads.

Loctite Material Specification[LMS]
LMS dated April 8, 1999. 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: 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

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Reference 1.1