LOCTITE

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Technical Data Sheet

Product 3494

Industrial Version, June 2000

PRODUCT DESCRIPTION

LOCTITE® Product 3494 is a single component, medium viscosity, fast UV/Visible curing adhesive specifically designed for bonding glass to itself and to a variety of other surfaces. The product cures in seconds upon exposure to suitable ultraviolet or visible radiation to form an impact resistant bond which exhibits excellent resistance to prolonged humidity or water immersion.

TYPICAL APPLICATIONS

Bonding and sealing or potting applications of glass to itself or other materials, such as decorative glass, molded glass tableware items, automotive window latches or lighting components.

PROPERTIES OF UNCURED MATERIAL

	Typical Value
Chemical Type	Modified acrylic
Appearance	Clear, pale straw
Specific Gravity @ 25°C	1.02
Viscosity @ 25°C, mPa.s (cP)	5,500
Brookfield RVT	
Spindle #6 @ 20 rpm	
Refractive Index 25°C, N_r	1.484
Toxicity	Low
Flash Point (TCC), °C	>93

TYPICAL CURING PERFORMANCE

The tables below illustrate fixture times for adhesive through highly transmitting substrates with different light sources, light intensities and gaps.

Fixture time vs light source, 0 gap.

Lamp Type, Irradiance	Fixture Time, sec
BondWand, 6 mW/cm^2	≤5
Fusion D bulb, 50 mW/cm^2	≤5
Metal Halide (Visible), 30 mW/cm^2	≤5
Metal Halide (Visible), 50 mW/cm^2	≤5
Metal Halide (UV), 30 mW/cm^2	≤5
Metal Halide (UV), 50 mW/cm^2	≤5

Fixture time vs gap, Hg arc lamp

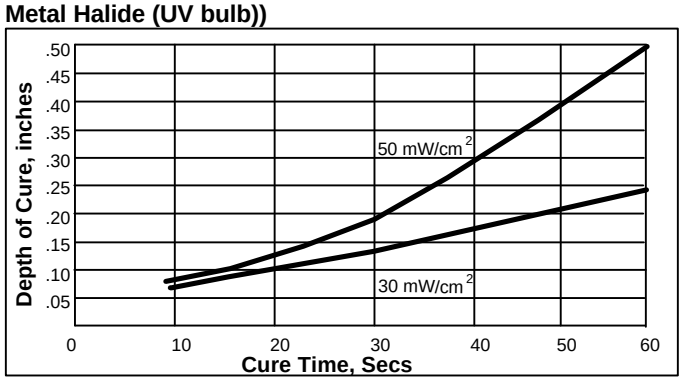
Irradiance, mW/cm^2	Gap, mils	Cure Time, sec
30	0	≤5
100	0	≤5
30	20	≤5
100	20	≤5

UV irradiances measured @ 365nm with 306 UV Powermeter.

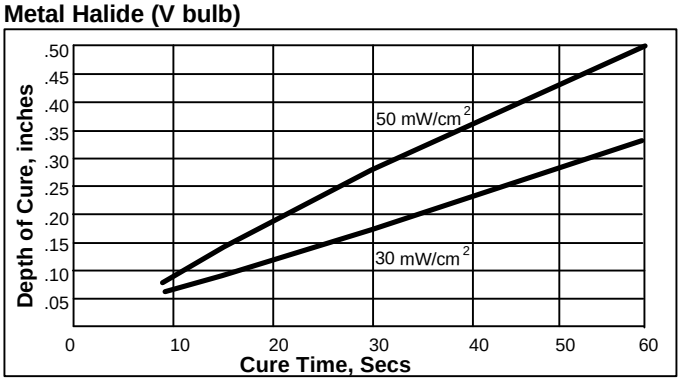
Depth of Cure

The following graphs illustrate depth of cure with various light sources and irradiances.

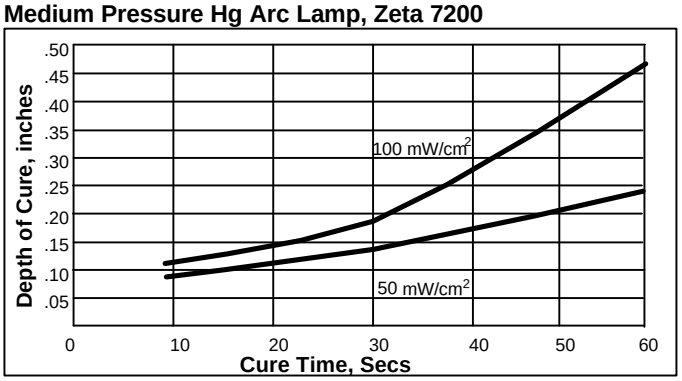
Metal Halide (UV bulb))



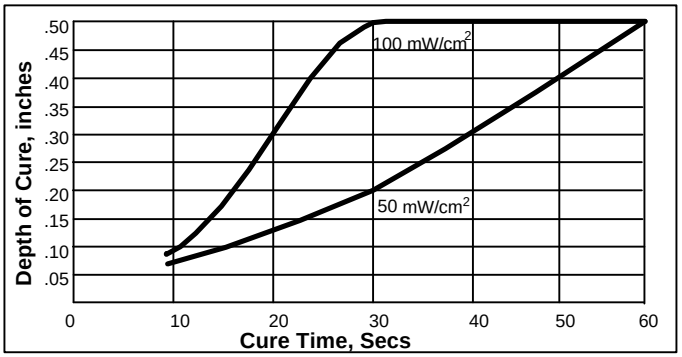
Metal Halide (V bulb)



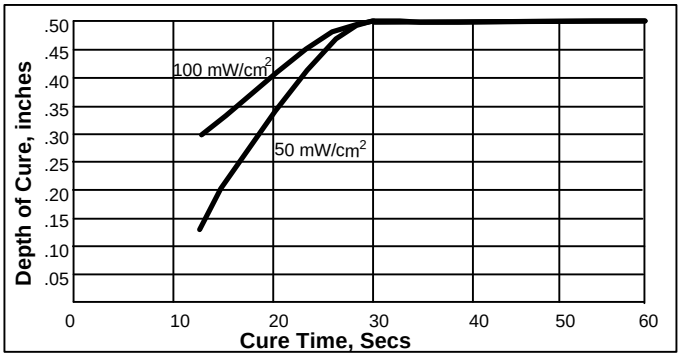
Medium Pressure Hg Arc Lamp, Zeta 7200



Fusion* D bulb



Fusion V bulb



Surface Cure Time

This is the time required to achieve a tack free surface.

Surface Cure Time, sec	UV Intensity (mW/cm^2)		
Lamp Type	30	50	100
Metal Halide – UV Bulb	>300	>300	
Metal Halide – V Bulb	>300	>300	
Mercury Arc		>75 ≤ 90	>45 ≤ 60
Fusion D Bulb		>210 ≤ 240	>150 ≤ 180
Fusion V Bulb		>300	>210 ≤ 240

TYPICAL PROPERTIES OF CURED MATERIAL

Cure: Fusion D @ 100 mW/cm^2 for 30 sec per side plus 24 hrs at RT

	Typical Value
Tensile Strength at break, ASTM D882, psi	3,270
% elongation to break, ASTM D882, %	190
Modulus, ASTM D882, psi	75,400
Hardness Shore D, ASTM D2240	65
Water Absorption, ASTM D570, 2 hrs boiling H_20, %	4.08
Refractive Index, N_D (solid)	1.515
Coefficient of Thermal Expansion, ASTM E831, /°C	
Pre Tg	87 x 10^{-6}
Post Tg	250 x 10^{-6}
Glass Transition Temperature, ASTM E3418, °C	31

Electrical Properties		Constant	Loss
Dielectric constant & loss, ASTM D150	@ 1 kHz	3.995	0.0228
	@ 10 kHz	3.884	0.0201
	@ 100 kHz	3.761	0.0244
Volume resistivity, ASTM D257, Ω.cm		3.3 x 10^{15}	
Surface resistivity, ASTM D257, Ω		3.0 x 10^{15}	
Dielectric strength, ASTM D149, V/mil		821	

PERFORMANCE OF CURED MATERIAL

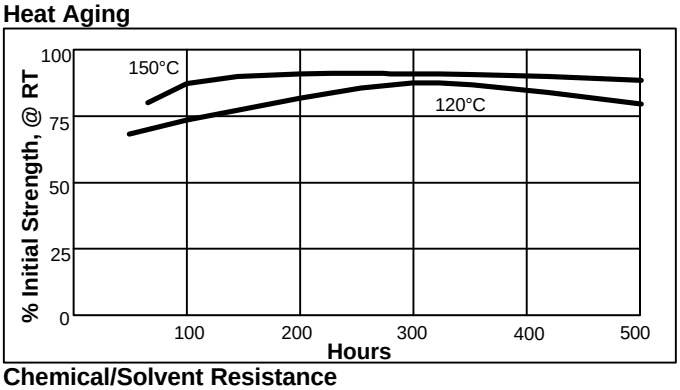
Cure: Fusion D @ 100 mW/cm^2 for 30 sec per side plus 24 hrs at RT

	Typical Value
Block Shear Strength, ASTM D4501, psi	
Steel to glass	2,440
Aluminum to glass	2,000
G-10 Epoxy to glass	1,080
Polycarbonate to glass	680
PVC to glass	940
ABS to glass	770

TYPICAL ENVIRONMENTAL RESISTANCE

Test: Block Shear vs Substrate, ASTM D4501
Substrate: Steel to Glass
Cure: Fusion D @ 100 mW/cm^2 for 30 sec per side plus 24 hrs at RT
Aged at temperature indicated and tested at 22°C.

Heat Aging



Chemical/Solvent Resistance

Solvent	Temp	% Initial Strength retained at		
		300 hr	500 hr	1000 hr
Condensing Humidity	49°C	78	74	62
Motor Oil, 10W-30	22°C	75	60	90
Unleaded Gasoline	22°C	72	67	54
Salt/Fog	22°C	93	80	77

Solvent	Temp.	% Initial Strength retained	
Boiling Water	100°C	2 hours	87
Water Immersion	49°C	170 hours	69
Isopropanol Immersion	22°C	24 hours	87

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

This product is UV and Visible light sensitive. Exposure to daylight, UV light and artificial light should be kept to a minimum during storage and handling. Product should be dispensed from applicators with black feed lines. For best performance bond surfaces should be clean and free from grease. 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.

Recommended intensity for cure in an adhesive application (between substrates) is 40 mW/cm^2 minimum (measured at the bondline) with an exposure time of 5-6 times the fixture time at this same intensity. For tack-free surface cure, as necessary in coating, potting or tacking applications, higher intensity UV is required (100 mW/cm^2 minimum).

Cooling should be provided for temperature sensitive substrate such as thermoplastic. Plastic grades should be checked for risk of stress cracking when exposed to liquid adhesive. Excess adhesive can be wiped away with organic solvent. Bonds should be allowed to cool before subjecting to any service loads**.**

Storage

Product shall be ideally stored in a cool, dry location in unopened containers at a temperature between 8°C to 28°C (46°F to 82°F) unless otherwise labeled. Optimal storage is at the lower half of this temperature range. To prevent contamination of unused product, do not return any material to its original container. For further specific shelf life information, contact your local Technical Service Center.

Data Ranges

The data contained herein may be reported as a typical value and/or range Values are based on actual test data and are verified on a periodic basis.

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, **Loctite Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Loctite Corporation's products. Loctite 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 Loctite 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.