Technical Data Sheet

LOCTITE® EA 3355™

Known as LOCTITE® 3355™
January 2015

PRODUCT DESCRIPTION

LOCTITE® EA 3355™ provides the following product characteristics:

Technology	Epoxy
Chemical Type	Cationic epoxy
Appearance (uncured)	Light white translucent liquid[LMS]
Components	One component - requires no mixing
Viscosity	Medium
Cure	Ultraviolet (UV) light activation followed by room temperature cure or heat cure
Application	Bonding

LOCTITE® EA 3355™ has unique features that allow for fast processing and fixturing of parts. Once the adhesive has been activated with UV light, it has set open time that allows for assembly of parts. The product continues to cure at room temperature or rapidly cures when exposed to low temperature heat. The cured product exhibits low shrinkage and excellent thermal, water and chemical resistance. Typical applications include bonding of optical connectors, fibers, lenses, prisms and other electronic components where low shrinkage and low outgassing are required.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.2
Viscosity, Cone & Plate, 25 °C, mPa·s (cP):	
Cone CP50-1 @ shear rate 20 s^{-1}	2,200 to 5,500[LMS]

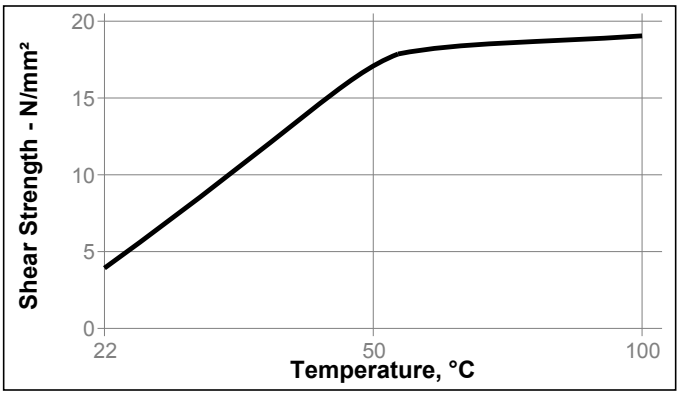
TYPICAL CURING PERFORMANCE

Recommended Curing Conditions

Pre-activated @ 50 to 150 mW/cm² , measured @ 365 nm for ≤20 seconds using a metal halide or high pressure mercury arc light source, followed by 24 hours @ 22 °C or 15 minutes @ 60 °C.

Cure Speed vs. Temperature

The graph below shows the shear strength developed with time on grit blasted steel lap shears, pre-activated @ 50 mW/cm² , measured @ 365 nm, for 5 seconds using a medium pressure mercury arc light source, cured for 15 minutes at different temperatures and tested @ 22 °C according to ISO 4587.



Fixture Time

The fixture time will depend on the substrate used, the lamp irradiance, the adhesive thickness, and the exposure time. The data below shows the fixture times achieved on different materials @ 22 °C. Irradiance was measured in the UVA region between 320 and 390 nm. Open time between the end of activation and assembly of parts was less than 5 seconds. Fixture time is defined as the time to develop a shear strength of 0.1 N/mm² .

Fixture Time, seconds:

Steel:

Metal Halide bulb:

70 mW/cm² :

for 20 seconds, 0.5 mm film	60
for 12 seconds, 1.0 mm film	150
for 10 seconds, 1.5 mm bead	390

High Pressure Hg Arc:

150 mW/cm² :

for 20 seconds, 0.5 mm film	90
for 10 seconds, 1.0 mm film	120
for 6 seconds, 1.5 mm bead	360

Aluminum:

Metal Halide bulb:

70 mW/cm² :

for 20 seconds, 0.5 mm film	60
for 12 seconds, 1.0 mm film	120
for 10 seconds, 1.5 mm bead	390

High Pressure Hg Arc:

150 mW/cm² :

for 20 seconds, 0.5 mm film	90
for 10 seconds, 1.0 mm film	90
for 6 seconds, 1.5 mm bead	420

PVC:
Metal Halide bulb:
70 mW/cm² :
for 10 seconds, 0.5 mm film 60
for 10 seconds, 1.0 mm film 90
for 10 seconds, 1.5 mm bead 300

High Pressure Hg Arc:
100 mW/cm² :
for 12 seconds, 0.5 mm film 30
for 10 seconds, 1.0 mm film 60
for 10 seconds, 1.5 mm bead 240

ABS:
Metal Halide bulb:
70 mW/cm² :
for 14 seconds, 0.5 mm film 60
for 12 seconds, 1.0 mm film 60
for 12 seconds, 1.5 mm bead 180

High Pressure Hg Arc:
100 mW/cm² :
for 14 seconds, 0.5 mm film 60
for 12 seconds, 1.0 mm film 60
for 13 seconds, 1.5 mm bead 390

TYPICAL PROPERTIES OF CURED MATERIAL

Pre-activated @ 50 mW/cm² , measured @ 365 nm, for 5 seconds using a medium pressure mercury arc light source, followed by 48 hours @ 22 °C

Physical Properties:

Coefficient of Thermal Expansion, ISO 11359-2, K^{-1}:		
Above Tg (32°C)		162
Below Tg (32°C)		69
Glass Transition Temperature ISO 11359-2, °C		32
Shore Hardness, ISO 868, Durometer D		78
Linear Shrinkage, ASTM D 792, %		1.0
Elongation, at break, ISO 527-3, %		7.4
Tensile Strength, at break, ISO 527-3	N/mm² (psi)	18 (2,700)
Tensile Modulus, ISO 527-3	N/mm² (psi)	1,049 (150,000)

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Pre-activated @ 100 mW/cm² , measured @ 365 nm, for 5 seconds using a medium pressure mercury arc light source, followed by 2 hours @ 100 °C, tested @ 22 °C

Lap Shear Strength, ISO 4587:

Steel (grit blasted), 0.5 mm film	N/mm² (psi)	≥13[LMS] (≥1,885)

Pre-activated @ 50 mW/cm² , measured @ 365 nm, for 5 seconds using a medium pressure mercury arc light source, followed by 72 hours @ 22 °C

Lap Shear Strength, ISO 4587:

Steel (grit blasted)	N/mm² (psi)	15 (2,200)
Aluminum (grit blasted)	N/mm² (psi)	17 (2,500)
PVC	N/mm² (psi)	18 (2,700)
ABS	N/mm² (psi)	5.2 (750)
G-10 Epoxyglass	N/mm² (psi)	13 (1,900)
Polybutylene Terephthalate (PBT)	N/mm² (psi)	5.4 (780)
Polycarbonate	N/mm² (psi)	5.2 (750)

TYPICAL ENVIRONMENTAL RESISTANCE

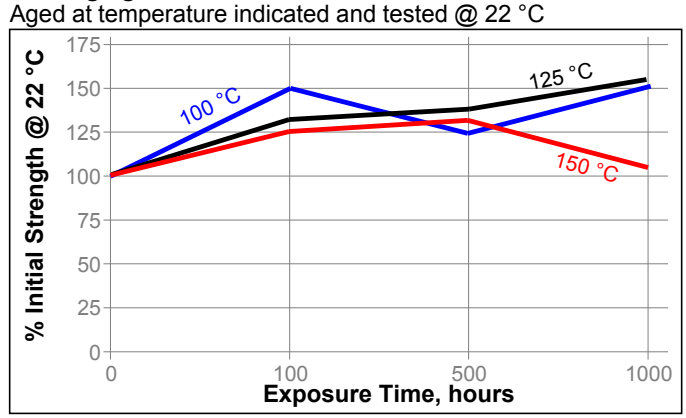
Pre-activated @ 50 mW/cm² , measured @ 365 nm, for 5 seconds using a medium pressure mercury arc light source, followed by 24 hours @ 22 °C

Lap Shear Strength, ISO 4587:

Steel (grit blasted)

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**
95% RH	40	100	95	90
Water/glycol	87	100	100	110
Motor oil	87	85	95	110
Unleaded gasoline	25	80	65	85
Isopropanol	25	80	70	95

GENERAL INFORMATION

For safe handling information on this product, consult the Safety Data Sheet (SDS).

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.

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. Product should be dispensed from applicators with black feed-lines.
2. Bond surfaces should be clean and free from grease.
3. UV cure rate is dependent on lamp intensity, distance from light source, depth of cure needed or bondline gap and light transmission of the substrate through which

the light must pass.
4. For the best activation time, the epoxy can be spread into a film over the bond area.
5. Post-assembly bondline gaps of less than 0.127 mm will give the best strength results.
6. Over-activated product will form a semi-hard surface and may turn dark brown before the two parts have been assembled. If this occurs, reduce the lamp irradiance or the activation exposure time, or both, on subsequent parts.
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 adhesive can be wiped away with isopropanol solvent.
10. Bonds should be allowed to cool before subjecting to any service loads.

Loctite Material Specification[LMS]
LMS dated September 29, 2005. 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

Reference 1.1