Technical Data Sheet

LOCTITE 3615

January 2014

PRODUCT DESCRIPTION

LOCTITE 3615 provides the following product characteristics:

Technology	Epoxy
Chemical Type	Epoxy
Appearance (uncured)	Red viscous gel[LMS]
Components	One component - requires no mixing
Cure	Heat cure
Application	Surface mount adhesive
Key Substrates	SMD components to PCB
Other Application Areas	Small parts bonding
Dispense Method	Syringe
Dispense Speed	Medium 15,000 -25,000 dots/h
Wet Strength	High

LOCTITE 3615 is designed for the bonding of surface mounted devices to printed circuit boards prior to wave soldering. It is specially formulated to have excellent moisture resistance and high adhesion to SMT components encapsulated in low stress molding compounds. Particularly suited for applications where medium dispense speeds, high dot profile, high wet strength and good electrical characteristics are required.

TYPICAL PROPERTIES OF UNCURED MATERIAL

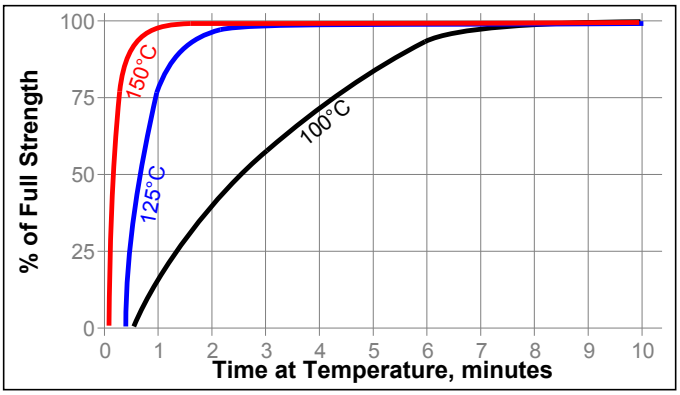
Specific Gravity @ 25 °C	1.2
Yield Point, 25 °C, Pa	300 to 625[LMS]
Cone & Plate Rheometer:	
Haake PK 100, M10/PK 1 2° Cone	
Casson Viscosity @ 25 °C, Pa·s	2 to 10
Cone & Plate Rheometer:	
Haake PK 100, M10/PK 1 2° Cone	
Particle Size, µm	<150
Flash Point - See SDS	

TYPICAL CURING PERFORMANCE

Recommended conditions for curing are exposure to heat above 100 °C (typically 90-120 seconds @ 150 °C). Rate of cure and final strength will depend on the residence time at the cure temperature.

Cure Speed vs. Time, Temperature

The following graph shows the rate of torque strength developed with time at different temperatures. These times are defined from the moment the adhesive reaches cure temperature. In practice, total oven time may be longer to allow for heat up period. Strength is measured on 1206 capacitors @ 22 °C, tested according to IPC SM817, TM-650 Method 2.4.42.



Isothermal DSC Conversion

5 minutes @ 125 °C, %	96 to 100[LMS]

TYPICAL PROPERTIES OF CURED MATERIAL

Cured for 30 minutes @ 150 °C

Physical Properties:

Coefficient of Thermal Expansion, ISO 11359-2, K^{-1}:		
Temperature Range 22°C to 62°C		70×10^{-6}
Temperature Range 125°C to 185°C		150×10^{-6}
Coefficient of Thermal Conductivity, ISO 8302, W/(m·K)		0.35
Specific Heat, kJ/(kg·K)		0.3
Density, BS 5350-B1 @ 25 °C, g/cm³		1.2
Glass Transition Temperature, ASTM D 4065, °C		110
Tensile Modulus, ISO 527-3	N/mm² (psi)	2,300 (333,000)

Electrical Properties:

Dielectric Constant / Dissipation Factor, IEC 60250:	
1 kHz	2.8 / 0.005
10 kHz	2.5 / 0.014
1,000 kHz	2.4 / 0.017
10,000 kHz	2.4 / 0.018
Volume Resistivity, IEC 60093, Ω·cm	68×10^{15}
Surface Resistivity, IEC 60093, Ω	75×10^{15}
Dielectric Breakdown Strength, IEC 60243-1, kV/mm	43.8
Electrolytic Corrosion, DIN 53489	A - 1.2

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 30 minutes @ 150 °C

Lap Shear Strength, ISO 4587:		
Steel (grit blasted)	N/mm² (psi)	≥15[LMS] (≥2,175)

Cured for 5 minutes @ 125 °C

Pull-off Strength, Siemens norm SN59651:		
C-1206 on bare FR4 board	N	52
	(lb)	(12)
Push-off Strength:		
C-1206 on bare FR4 board	N	≥35[LMS]
	(lb)	(≥7.8)
Torque Strength, IPC SM817,TM-650 Method 2.4.42:		
C-1206 on bare FR4 board	N·mm	52
	(in.oz)	(7.5)

Bond strength achieved in practice will vary considerably depending on the SMD component type, adhesive dot size and the type, grade and degree of cure of the solder mask/resist.

TYPICAL ENVIRONMENTAL RESISTANCE

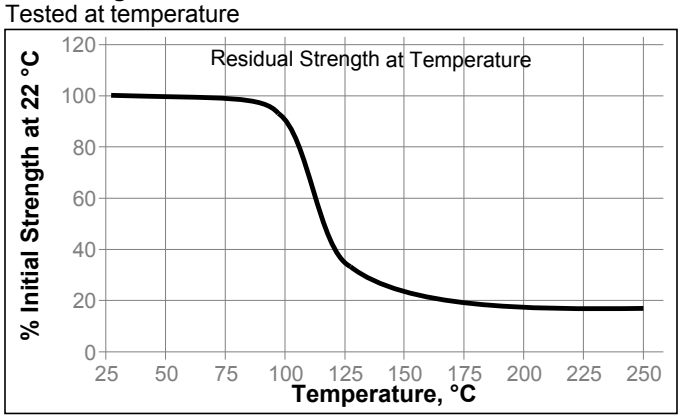
Cured for 30 minutes @ 150 °C

Lap Shear Strength, ISO 4587:

Mild steel (grit blasted)

Hot Strength

Tested at temperature



Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 22 °C.

		% of initial strength		
Environment	**°C**	**100 h**	**500 h**	**1000 h**
98% RH	40	86	75	75

Surface Insulation Resistance (SIR)

LOCTITE 3615 meets high standards of reliability and environmental resistance, such as SIR testing under electrical bias in high temperature and humidity. The following table shows test parameters and results of such a test under different conditions.

SIR TEST Comb Type	JIS 3197 Type 2 (IPC B25 B-comb)
Comb Dimensions	0.38 mm lines/space
Comb Material	bare copper
Adhesive Coating Thickness	0.1 mm
Adhesive Cure	150 °C, 30 minutes
Applied Bias Voltage / Test Voltage	16 V/250 V
Relative Humidity	85%
Test Temperature	85 °C
Test Duration	1000 hours
Inital Comb Resistance @ 23 °C, 50% R.H., Ω	1×10^{12}
Final Comb Resistance @ 85 °C, 85% R.H., Ω	1×10^{9}
Final Comb Resistance @ 23°C, 50% R.H., Ω	4.5×10^{9}

Resistance to Hot Solder Dip

Cured for 90 seconds @ 150 °C

Hot Solder Dip, IPC SM817, TM-650 Method 2.4.42.1, Pass/Fail:

R-1206 on bare FR4 board:

Supported 60 seconds above solder bath @ 260°C and dipped for 10 seconds — Pass

GENERAL INFORMATION

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

Directions for use:

1. LOCTITE 3615 is supplied de-aerated in a range of ready-to-use syringes which fit straight into a variety of air pressure/time dispensing systems commonly available.
2. After storage in a refrigerator the adhesive must be allowed to equilibrate to room temperature before use, typically 2 to 4 hours.
3. Avoid cross contamination with other adhesive residues by ensuring dispense nozzels, adapters etc. are thoroughly cleaned .
4. Do not leave dirty nozzles on dispensing equipment while not in use or soaking in solvents for long periods of time.
5. The quantity of adhesive dispensed will depend on the dispense pressure, time, nozzle size and temperature.
6. These parameters will vary depending on the type of dispensing system used and should be optimised accordingly.
7. Dispensing temperature should ideally be controlled at a value between 30 °C to 35 °C for optimum results, however higher dispense temperatures are possible.
8. LOCTITE 3615 can also be dispensed using positive displacement pump systems.
9. The product is not recommended for dispensing by pin transfer.
10. Uncured adhesive can be cleaned from the board with isopropanol, MEK or ester blends such as LOCTITE® 7360™.

Loctite Material Specification[LMS]

LMS dated September 18, 1997. 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: 2 °C to 8 °C. Storage below 2 °C or greater than 8 °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:
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Reference 1.1