

PRODUCT DESCRIPTION

LOCTITE™ Product LPD-221 is a single component, epoxy adhesive designed for use as a reworkable underfill resin for CSP(FBGA) or BGA. It cures rapidly on exposure to heat. It is designed to give excellent protection from failure due to mechanical stress. The low viscosity allows filling in gap under CSP or BGA.

Volume resistivity, ASTM D257, $\Omega \cdot \text{cm}$	8.3×10^{15}
Surface resistivity, ASTM D257, Ω	2.9×10^{15}
Dielectric strength, ASTM D149, kV/mm	14
Surface insulation resistance, IPC-TM650, Ω	
Initial	2.7×10^{12}
96 hours @ 85°C, 85% R.H.	2.0×10^{12}
5 DCV loaded	

PROPERTIES OF UNCURED MATERIAL

	Typical Value
Chemical Type	Epoxy
Appearance	Black liquid
Specific gravity @ 25°C	1.1
Viscosity @ 25°C, mPa.s	4,100
HAAKE viscometer, PK1, 2°	
Constant shear rate @ 36 1/s	

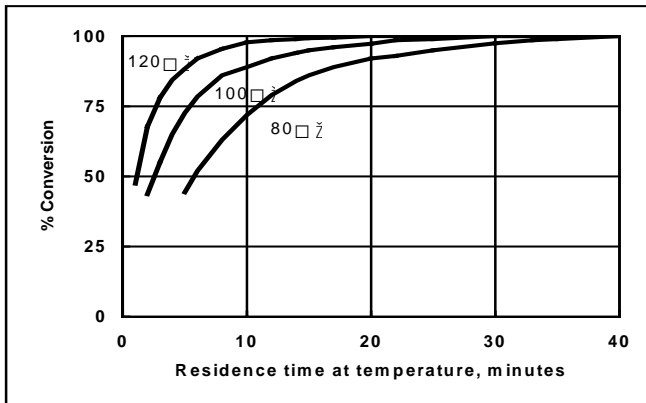
PERFORMANCE OF CURED MATERIAL

(Cured 60 min. @ 100°C)

	Typical Value
Shear strength, ASTM D1002, N/mm ²	
Grit blasted mild steel	6.7
Epoxy-Glass	4.9

TYPICAL CURING PERFORMANCE

Cure Time(DSC)



TYPICAL PROPERTIES OF CURED MATERIAL

(Cured 60 min. @ 100°C)

Physical Properties

Coefficient of thermal expansion ASTM E831, Pre Tg, /°C	64×10^{-6}
Post Tg, /°C	200×10^{-6}
Coefficient of thermal conductivity ASTM E1530, W/(mk)	0.19
Hardness (Shore D), ASTM D2240	64
Density @ 25°C, g/cm ³	1.2
Shrinkage, %	2.7
Water absorption, ASTM D570, 24 hrs @ 25°C, %	0.35
Glass transition temperature (Tg) via DMA, ASTM E1640, °C	39
Tensile strength at break, ASTM D882, N/mm ²	5.0
% Elongation at break, ASTM D882	68
Modulus, ASTM D882, N/mm ²	39

Electrical Properties

Dielectric constant & loss, ASTM D150	Constant	Loss
@ 1 kHz	4.5	0.05
@ 1 MHz	3.7	0.04
@ 10 MHz	3.5	0.03

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 oxidising materials.

Eye irritant; irritate to skin and skin sensitizer. Contains epoxy resins and amine. In case of eye contact, flush with water for at least fifteen minutes; get medical attention. Wash with plenty of soap and water after skin contact.

Excessive or repeated skin contact may cause skin irritation and skin sensitizer. If skin reaction occurs, discontinue use and consult a physician. To avoid skin contact, use the applicator nozzle provided. Other applicators are available from Loctite Corporation.

KEEP MATERIAL AWAY FROM CHILDREN.

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

Storage

Product shall be ideally stored in a cool, dry location in unopened containers at a temperature between 2°C to 10°C unless otherwise labelled. 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 Centre.

Data Ranges

The data contained herein may be reported as a typical value and/or range (based on the mean value ± 2 standard deviations). 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

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PLEASE CONTACT LOCTITE CORPORATION QUALITY DEPARTMENT FOR ASSISTANCE AND RECOMMENDATIONS ON SPECIFICATIONS FOR THIS PRODUCT.
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