

LOCTITE

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Technical Data Sheet

Product 3618

Electronics Product, October 1998

PRODUCT DESCRIPTION

LOCTITE® Product 3618 is a one component, epoxy adhesive which cures rapidly on exposure to heat. It's viscosity characteristics and de-aerated condition makes it suitable for high speed SMT dispensing and excellent drop shape control.

TYPICAL APPLICATIONS

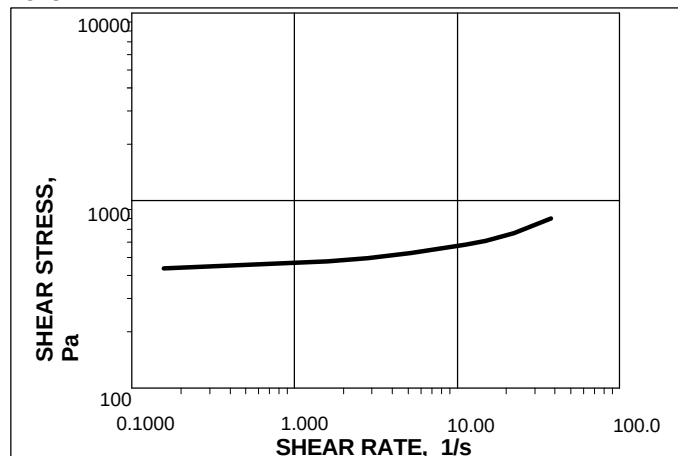
Bonding of surface mounted devices to printed circuit boards prior to wave soldering. Particularly suited where very high speed dispensing, good dot profile, high moisture resistance high wet strength and high electrical specifications are required.

PROPERTIES OF UNCURED MATERIAL

	Value	Typical Range
Chemical Type	Epoxy	
Appearance	Dark Red Gel	
Specific Gravity @ 25°C	1.2	
Particle size	<80 micron	
Viscosity @ 25°C, Pa.s	5	2 to 10
Yield value @ 23°C, Pa:	400	300 to 550
(Haake PK100, M10/PK1 2°Cone Casson Model over 0.4-30 1/s)		

Flow Curve

The graph below shows a typical flow curve as measured using a Haake rotoviscometer PK100, M10/PK1 2°Cone system at 23°C.

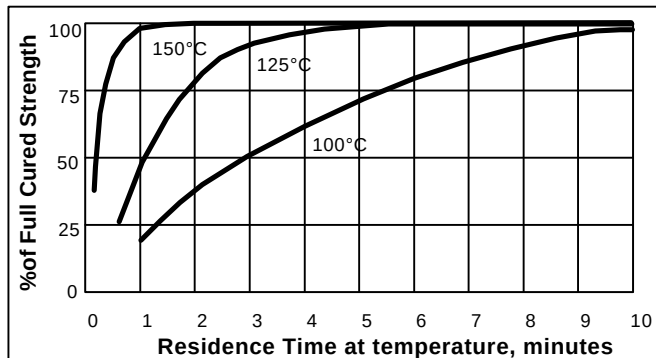


TYPICAL CURING PERFORMANCE

Recommended conditions for curing are exposure to heat above 100°C, typically 90 secs @ 125°C or 60 secs. at 150°C). Rate of cure and final strength will depend on the residence time at the cure temperature.

Cure Speed vs. 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 will be longer to allow for heat up period. Strength is measured on 1206 capacitors at 22°C, tested according to IPC SM817, (2.4.42).



Physical Properties

Coefficient of thermal conductivity, ASTM C177, W.m ⁻¹ .K ⁻¹	0.3
Specific Heat, kJ.kg ⁻¹ .K ⁻¹	0.3
Density, g/cm ³	1.2
Glass Transition temperature. Tg. °C ASTM E 831	110

Electrical Properties

Dielectric constant & loss, 25°C, ASTM D150:

	Constant	Loss
measured at 10kHz:	2.2	0.010
1Mhz:	2.1	0.011
10MHz:	2.1	0.012
Volume resistivity, ASTM D257,Ω.cm		6.5 x 10 ¹⁶
Surface resistivity, ASTM D257, Ω		7.1 x 10 ¹⁶
Dielectric Strength 25°C, ASTM D149 kV.mm-1		53.1
Surface Insulation Resistance, ohms:		
(IPC TM 650, 2.6.3.3, B25 test boards, copper, B-comb)		
Initial		10 ¹⁰
7 days @ 40°C, 95% RH		10 ¹¹
Electrolytic Corrosion, DIN 53489		AN - 1.4

PERFORMANCE OF CURED MATERIAL

	Value	Typical Range
Shear strength on grit blasted mild steel, (GBMS) (cured 30 mins @ 150°C)		
ASTM D 1002, N/mm ²	17.5	15 to 20
(psi)	(2530)	(2200 to 2880)
Strength of C-1206 to bare FR4 board, according to IPC SM817 (cured for 5 mins @ 125°C)		
Pull-off Strength, N:	60	40 to 80
(lb)	(13)	(9 to 18)
Torque Strength, N.mm:	60	45 to 75
(in.oz)	(8.5)	(6.3 to 10.5)

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

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 supplied de-aerated in a range of ready-to-use syringes which fit straight into a variety of dispensing machines commonly available.

Product shall be ideally stored in refrigerated, dry location in unopened containers at a temperature between 2° - 8°C (36°-46°F) unless otherwise labelled.

After storage the adhesive must be allowed to equilibrate to room temperature before use, (typically 24 hours). Avoid cross contamination with other epoxy or acrylic adhesives by ensuring dispense nozzles, adaptors, etc., are thoroughly cleaned. Do not leave dirty nozzles on machine for long periods while machine not in use. Do not leave dirty nozzles to soak in solvents for long periods.

The quantity of adhesive dispensed will depend on the dispense pressure, time, nozzle size and temperature. These parameters will vary depending on machine type and should be optimised accordingly. Dispense temperature should ideally be controlled at a value between 25°-30°C for optimum results, however higher dispense temperatures are possible.

This product can also be dispensed using positive displacement pump systems. This product is not recommended for dispensing by pin transfer. Uncured adhesive should only be cleaned from the board with solvents compatible with epoxy adhesives, such as Loctite 7360. Contact Loctite for detailed cleaning recommendations.

Approvals

This product is certified to meet the requirements of:

Belcore approval TR-NWT-000078 : "General physical design requirements for telecommunications products and equipment" issued by Bell Communications Research, USA. Items covered in this approval are : Resistance to Fungal Growth, Adhesion, Resistance to Solder, Electromigration

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 which 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.