Technical Data Sheet

LOCTITE 3549

January 2016

PRODUCT DESCRIPTION

LOCTITE 3549 provides the following product characteristics:

Technology	Epoxy
Appearance	Black
Components	One-component
Product Benefits	● Reworkable ● Fast flow ● Low temperature cure ● High adhesion to flexible and rigid substrates ● Excellent protection for solder joints against induced stresses
Cure	Heat Cure
Application	Underfill
Typical Assembly Applications	BGA and CSP Devices

LOCTITE 3549 reworkable epoxy underfill is designed to provide protection for solder joints against induced stress, increasing both drop test and temperature cycle performance of the device.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Density, @ 25 °C, g/cm³	1.3
Viscosity @ 25 °C, mPa·s (cP):	
Haake PK100 @ 36 S^{-1}	2,350
Cone & Plate, Spindle 52, speed 50 rpm	2,100
Filler Content, %	18
Pot Life @ 25 °C (time to double viscosity), days	14
Shelf Life @ -25 to -15°C, days	365
Flash Point - See SDS	

TYPICAL CURING PERFORMANCE

Recommended Cure Schedule

5 minutes @ 120 °C
3 minutes @ 130 °C
1 minute @ 150 °C reflow

Optional Reflow Cure (for Drop Test Reliability)

2 minutes @ 130°C

Substrate Temperature

Up to 70°C

Differential Scanning Calorimetry

Exotherm onset, °C	100 to 115

Peak Exotherm Temperature

Peak Temperature, °C	105 to 115

The above cure profile is a guideline recommendation. Cure conditions (time and temperature) may vary based on customers' experience and their application requirements, as well as customer curing equipment, oven loading and actual oven temperatures.

TYPICAL PROPERTIES OF CURED MATERIAL

Sample cured , 1 hour @ 125°C

Physical Properties

Coefficient of Thermal Expansion ISO 11359-2, K^{-1}:		
Below Tg		55
Above Tg		177
Glass Transition Temperature (Tg) by TMA, °C:		
TMA from -50 to 300ºC @ 10ºC/minute		38
Storage Modulus:		
DMA from 22 to 300ºC @ 10ºC/minute	N/mm² (psi)	2,000 (290,075)

Electrical Properties

Volume Resistivity, IEC 60093, Ω·cm	81×10^{15}
Surface Resistivity, IEC 60093, Ω	0.2×10^{15}

GENERAL INFORMATION

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

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.

Not for product specifications

The technical data contained herein are intended as reference only. Please contact your local quality department for assistance and recommendations on specifications for this product.

Removal Procedure

1. Heat the underfill to approximately 220 °C using a hot air nozzle on standard BGA rework equipment.
2. Twist and remove the component.
3. Use a tacky flux together with a vacuum nozzle attachment to remove residue.

Storage

Store product in the unopened container in a dry location. Storage information may be indicated on the product container labeling.

Optimal Storage : -25 to -15 °C

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
N x 0.225 = lb
N/mm x 5.71 = lb/in
psi x 145 = N/mm²
MPa = N/mm²
N·m x 8.851 = lb·in
N·m x 0.738 = lb·ft
N·mm x 0.142 = oz·in
mPa·s = cP

Disclaimer

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