



# PRODUCT / PROCESS CHANGE NOTIFICATION

PCN-000384

Date: 05/18/2016

P1/2

<input type="checkbox"/>	Semtech Corporation, 200 Flynn Road, Camarillo CA 93012
<input type="checkbox"/>	Semtech Canada Corporation, 4281 Harvester Road, Burlington, Ontario L7L 5M4 Canada
<input type="checkbox"/>	Semtech Irvine, 5141 California Ave., Suite 100, Irvine CA 92617
<input type="checkbox"/>	Semtech Neuchatel Sarl, Route des Gouttes d'Or 40, CH-2000 Neuchatel Switzerland
<input type="checkbox"/>	Nanotech Semiconductor, Semtech Corporation, 2 West Point Court, Bristol, United Kingdom, BS32 4PY
<input type="checkbox"/>	Semtech Corpus Christi SA de CV, Carretera Matamorros Edificio 7, Reynosa, Tamaulipas, Mexico 88780
<input checked="" type="checkbox"/>	Semtech Triune, 1101 Resource Drive, Suite 121, Plano TX 75074
<input type="checkbox"/>	

### Change Details

<b>Part Number(s) Affected:</b>  SC2446ITETRT SC2677BTETRT SC441ATETRT SC441TETRT SC445TETRT SC446TETRT SC530ATETRT	<b>Customer Part Number(s) Affected:</b> <input checked="" type="checkbox"/> N/A
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**Description, Purpose and Effect of Change:**

- 1) Ablestik/Henkel produces 2600AT HT epoxy. Their supplier discontinued one of the raw materials in the formulation. Ablestik has issued an EOL notification to all of their customers. Semtech's supplier, Carsem is affected. Product assembled at Carsem are identified and impacted by this change.
- 2) The replacement epoxy for the 2600AT epoxy for TSSOP is QM1519. It passed qualification testing at Carsem and Semtech. The thermal performance of QM1519 is equivalent to the 2600AT epoxy.
- 3) Carsem has completed reliability testing of this change and it meets Semtech's reliability requirements and meets JEDEC guidelines.
- 4) The short implementation time is due to the limited and short supply of existing Ablestik 2600AT epoxy.

<b>Change Classification</b>	<input type="checkbox"/> Major <input checked="" type="checkbox"/> Minor	<b>Impact to Form, Fit, Function</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>Impact to Data Sheet</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<b>New Revision or Date</b>	<input checked="" type="checkbox"/> N/A

**Impact to Performance, Characteristics or Reliability:**

- No Impact to product form, fit, function, quality, application, performance, characteristics or reliability.
- No Change to data sheet content or package dimensions.



# PRODUCT / PROCESS CHANGE NOTIFICATION

PCN-000384

Date: 05/18/2016

P2/2

<b>Implementation Date</b>	07/19/2016	<b>Work Week</b>	WW30
<b>Last Time Ship (LTS)</b> Of unchanged product	08//19/2016	<b>Affecting Lot No. / Serial No. (SN)</b>	N/A
<b>Sample Availability</b>	Yes	<b>Qualification Report Availability</b>	Yes

**Supporting Documents for Change Validation/Attachments:**

- Ablestik Technical Data Sheet; ABLETHERM 2600AT-EN
- Technical Data sheet; QM1519
- QMI519 RoHS HBCDD Phthalates CE\_2016\_33558
- QMI519 Halogen CE\_2016\_33555
- QMI519 PFOS PFOA CE\_2016\_33559
- QMI519 Phosphorus CE\_2016\_33557

**Issuing Authority**

<b>Semtech Business Unit:</b>	Power MGT	
<b>Semtech Contact Info:</b>	<p><i>Randy Biddle</i>            Engineer Sr., Product Quality            Semtech Corporation            1101 Resource Dr. Suite 121            Plano, Texas 75074  <a href="mailto:rbiddle@semtech.com">rbiddle@semtech.com</a>            Voice: (469) 277-6078</p>	

FOR FURTHER INFORMATION & WORLDWIDE SALES COVERAGE: <http://www.semtech.com/contact/index.html#support>



# QMI519™

March 2008

## PRODUCT DESCRIPTION

QMI519™ provides the following product characteristics:

<b>Technology</b>	Silver Filled
<b>Appearance</b>	Silver
<b>Components</b>	One component - requires no mixing
<b>Cure</b>	Heat cure
<b>Application</b>	Die attach

QMI519™ is a silver filled conductive adhesive for attachment of integrated circuits and components to metal leadframes advanced substrates. This material is hydrophobic and stable at high temperatures. These features produce a void-free bond line with excellent interfacial adhesion strength to a wide variety of metal surfaces, including Palladium, Alloy 42. A package or device manufactured with QMI519™ will have good resistance to delamination and “popcorning” after exposure to reflow temperatures. The adhesive also has excellent electrical and thermal conductivity properties. QMI519™ is designed to achieve UPHs several orders of magnitude higher than conventional oven cured adhesives. Maximum productivity is realized through in-line cure, either on the diebonder using a post diebond heater or on the wirebonder preheater. Studies have also shown improved coplanarity in parts cured on the diebonder.

## TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	3.8
Viscosity @ 25 °C, cPs:	
Speed 5 rpm	9,000
Thixotropic Index (Speed 0.5/speed 5)	4.2
Pot Life @ 25 °C, hours	48
Ionic Contaminants, ppm:	
Na+, K+	≤20
Ionic Contaminants, ppm:	
Cl-, F-	≤20
Moisture Absorption, wt. %	≤0.2
168 hours @ 85°C/85 RH	
Flash Point - See MSDS	

## TYPICAL PROPERTIES OF CURED MATERIAL

Cured for @ 25 °C

### Physical Properties:

Coefficient of Thermal Expansion TMA:	
alpha1, ppm/°C	40
alpha2, ppm/°C	140
Coefficient of Thermal Conductivity, ASTM E 1461, W/(m·K)	3.8
Glass Transition Temperature, °C	75
DMA modulus @ 25°C, GPa	5.3

## Electrical Properties:

Volume Resistivity, IEC 60093, Ω·cm 0.001

## TYPICAL PERFORMANCE OF CURED MATERIAL

### Adhesive Properties

### Miscellaneous

Die Shear Strength:

1 mil BLT, Ag-plated Cu, 300 mil/side die Average 10 Mpa @ 25°C

## GENERAL INFORMATION

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

### Directions for use

#### Dispensing and Bondline Control:

- Since thinner bondlines increase stress and may affect adhesion, please call your nearest Loctite technical service engineer for consultation in cases where bondlines less than 1mil are desired.

QMI519™ has excellent rheology and flows easily under shear stresses such as those present during die bonding. Therefore, bondforces used with other adhesives, which produce a certain bondline thickness, may result in thinner bondlines with QMI519™. Optimization of diebonding parameters is strongly recommended to consistently meet target bondline thicknesses.

### 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.

### Cure Schedule

SkipCure™	≥6 seconds @ 260 °C
Conventional Oven	15 minutes @ 180 °C
Snap Cure Oven	≥10 seconds @ 240 °C
Tunnel Oven:	≥10 seconds @ 240 °C
configured with hot gas or IR	

QMI519™ can be cured using a variety of times and temperatures, depending upon the specific cure equipment. Typical cure profiles are listed below. In these profiles, the temperatures stated are bondline temperatures and the stated times are at temperature.



**Storage**

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

**Optimal Storage: -40 °C. Storage below minus (-)40 °C or greater than minus (-)40 °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**

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$

$\text{kV/mm} \times 25.4 = \text{V/mil}$

$\text{mm} / 25.4 = \text{inches}$

$\text{N} \times 0.225 = \text{lb}$

$\text{N/mm} \times 5.71 = \text{lb/in}$

$\text{N/mm}^2 \times 145 = \text{psi}$

$\text{MPa} \times 145 = \text{psi}$

$\text{N}\cdot\text{m} \times 8.851 = \text{lb}\cdot\text{in}$

$\text{N}\cdot\text{m} \times 0.738 = \text{lb}\cdot\text{ft}$

$\text{N}\cdot\text{mm} \times 0.142 = \text{oz}\cdot\text{in}$

$\text{mPa}\cdot\text{s} = \text{cP}$

**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, **Henkel Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel 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 Henkel Corporation patents that 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.

**Trademark usage**

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Reference 0.0



# ABLETHERM 2600AT

July 2010

## PRODUCT DESCRIPTION

ABLETHERM 2600AT provides the following product characteristics:

<b>Technology</b>	Thermal Management
<b>Appearance</b>	Silver
<b>Cure</b>	Heat cure
<b>Product Benefits</b>	<ul style="list-style-type: none"> <li>• High thermal conductivity</li> <li>• High electrical conductivity</li> <li>• Low bleed</li> <li>• Long work life</li> </ul>
<b>Application</b>	Die attach
<b>Filler Type</b>	Silver
<b>pH</b>	4.4

ABLETHERM 2600AT adhesive is designed for thermal management applications requiring high heat extraction from the die, such as high power and discrete devices. This adhesive uses a unique suspension system containing silver and resin particles suspended in solvent carrier. Once the material is fully cured and the solvent is evaporated, the adhesive has an extremely high silver loading.

## TYPICAL PROPERTIES OF UNCURED MATERIAL

Thixotropic Index (0.5/5 rpm)	6.0
Viscosity, Brookfield CP51, 25 °C, mPa·s (cP): Speed 5 rpm	8,500
Work Life @ 25°C, hours	24
Shelf Life @ -40°C, year	1
Flash Point - See MSDS	

## TYPICAL CURING PERFORMANCE

### Cure Schedule

30 minute ramp to 200°C + 15 minutes @ 200°C

### Alternative Cure Schedule

30 minute ramp to 175°C + 1 hour @ 175°C

### Weight Loss on Cure

10 x 10 mm Si die on glass slide, % 9.19

The above cure profiles are guideline recommendations. 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

### Physical Properties:

Coefficient of Thermal Expansion ppm/°C:	
Below Tg, ppm/°C	35
Above Tg, ppm/°C	118

Glass Transition Temperature (Tg) by TMA, °C	84
Thermal Conductivity, W/mK	20
Tensile Modulus, DMTA :	
@ -65 °C	N/mm <sup>2</sup> 5,262 (psi) (763,000)
@ 25 °C	N/mm <sup>2</sup> 3,648 (psi) (529,000)
@ 150 °C	N/mm <sup>2</sup> 297 (psi) (43,000)
@ 250 °C	N/mm <sup>2</sup> 214 (psi) (31,000)

Extractable Ionic Content, @ 100°C ppm:	
Chloride (Cl-)	<20
Sodium (Na+)	<20
Potassium (K+)	<10
Water Extract Conductivity, µmhos/cm	22
Moisture Absorption @ Saturation, wt.% @ 85°C/85%RH	0.25

### Electrical Properties:

Volume Resistivity, ohms-cm	0.00005
Bond Joint Resistance, ohms/0.5 sq.in. Cu to Cu joint 25 µm bondline thickness	0.00005

## TYPICAL PERFORMANCE OF CURED MATERIAL

### Die Shear Strength:

2 x 2 mm Si die on Ag/Cu leadframe, kg-f 8.1  
@ 25°C

### Die Shear Strength vs Temperature, kg-f:

@25°C	@200°C	@250°C	3 x 3 mm Si die on:
18.3	1.3	1.1	Ag/Cu leadframe
12.7	1.2	1.1	Cu leadframe
16.4	1.2	0.9	Pd/Ni leadframe
9.7	2.3	2.1	Au flash leadframe

### Chip Warpage vs Chip Size:

0.38 mm thick Si die on Ag/Cu leadframe @25°C, µm

Chip Size:	Warpage:
7.6 x 7.6 mm	15
12.7 x 12.7 mm	58

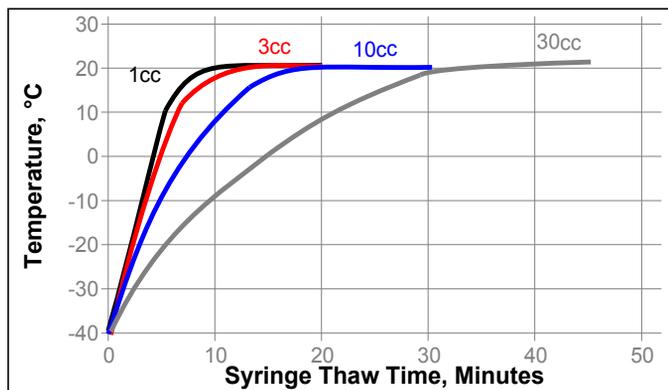
## GENERAL INFORMATION

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



## THAWING:

1. Allow container to reach room temperature before use.
2. After removing from the freezer, set the syringes to stand vertically while thawing.
3. Refer to the Syringe Thaw time chart for the thaw time recommendation.
4. DO NOT open the container before contents reach 22°C temperature. Any moisture that collects on the thawed container should be removed prior to opening the container.
5. DO NOT re-freeze. Once thawed to 22°C, the adhesive should not be re-frozen.



## DIRECTIONS FOR USE

This adhesive is a unique suspension system that contains polymer and conductive particles in a solvent carrier. These particles can sometimes agglomerate and could make dispensing difficult for some applications. Due to the unique rheology of this adhesive, clogging of longer dispense tubes may occur due to particle packing. Use of short dispense tubes is recommended.

For consistent and uniform dispensing, a 457mm (18 mil) or greater ID needle is suggested for this adhesive. For sizes smaller than 2 x 2mm and thinner dies, a smaller ID needle may be used.

Solvent bleed-out that appears after dispensing will volatilize during the oven cure process. Once it volatilizes, it will not redeposit onto the leadframes. For best results, our recommended cure profile is suggested.

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Reference 0.3