

# LOCTITE ABLESTIK ICP 9000

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## PRODUCT DESCRIPTION

LOCTITE ABLESTIK ICP 9000 provides the following product characteristics:

<b>Technology</b>	Semi-sintering
<b>Appearance</b>	Silver liquid
<b>Filler Type</b>	Silver
<b>Cure</b>	Heat cure
<b>Product Benefits</b>	<ul style="list-style-type: none"> <li>• One component</li> <li>• Electrically conductive</li> <li>• Good electrical stability</li> <li>• No resin bleed-out</li> <li>• Good workability</li> <li>• Good sintering properties when used on Ag, PPF, Au and Cu substrates</li> <li>• High thermal stability</li> <li>• High reliability</li> <li>• Solder replacement</li> </ul>
<b>Application</b>	Component assembly, ECA
<b>Typical Applications</b>	Sn/Pb and Au/Sn solder replacement
<b>Typical Assembly Applications</b>	Power IC, SiC power devices and GaAs and GaN die transistors

LOCTITE ABLESTIK ICP 9000 is a silver-filled, semi-sintering adhesive specially designed for use in the assembly of high power and high temperature electronic devices. It is formulated with a more enhanced resin bleed control.

LOCTITE ABLESTIK ICP 9000 is designed to provide high adhesion and low stress which are essential for the thermal and reliability performances of high end power IC packages, SiC power devices, GaAs and GaN die transistors. The thermal performance of this material is comparable to that of a solder paste product.

## TYPICAL PROPERTIES OF UNCURED MATERIAL

Thixotropic Index (0.5/5 rpm)	5.5
Viscosity, Brookfield CP51, 25 °C, mPa·s (cP):	
Speed 5 rpm	11,500
Work Life @ 25°C, hours	16
Open time @ 25°C, hours	2
Shelf Life @ -40°C (from date of manufacture), days	365
Flash Point - See SDS	

## TYPICAL CURING PERFORMANCE

### Cure Schedule

Conventional Oven  
1 hour @ 200°C

For the die size <5 x 5 mm

- 20 minutes ramp from 25°C to 130°C, hold for 30 to 60 minutes; 15 minutes ramp to 200°C, hold for 120 minutes air oven or in N<sub>2</sub>

For the die size >5 x 5 mm

- 20 minutes ramp from 25°C to 130°C, hold for 120 minutes; 15 minutes ramp to 200°C, hold for 120 minutes air oven or in N<sub>2</sub>

### Alternate Cure Schedule

Suitable for Ag, Au and PPF substrates

- 20 minutes ramp from 25°C to 130°C, hold for 30 minutes; 10 minutes ramp to 175°C, hold for 60 minutes air oven or in N<sub>2</sub>

### Weight Loss on Cure

Weight Loss on Cure, % -4.0

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

Glass Transition Temperature (T <sub>g</sub> ), °C	25
Coefficient of Thermal Expansion, TMA, ppm/°C:	
Below T <sub>g</sub>	25
Above T <sub>g</sub>	103
Thermal Conductivity, W/(m·K)	100
Dynamic Tensile Modulus, DMA:	
@ -65°C	N/mm <sup>2</sup> 15,600 (psi) (2.26×10 <sup>+6</sup> )
@ 25°C	N/mm <sup>2</sup> 12,500 (psi) (1.81×10 <sup>+6</sup> )
@ 150°C	N/mm <sup>2</sup> 1,100 (psi) (160,000)
@ 250°C	N/mm <sup>2</sup> 650 (psi) (94,300)

Extractable Ionic Content :	
Chloride (Cl-), ppm	20
Sodium (Na+), ppm	1.5
Potassium (K+), ppm	0.5
Moisture Absorption, %	0.21

**Electrical Properties**

Volume Resistivity, ohm-cm	$7 \times 10^{-06}$
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**TYPICAL PERFORMANCE OF CURED MATERIAL****Thermal Properties**

In-package Thermal Resistance:	
7 x 7 mm <sup>2</sup> QFN and 2.5 x 2.5 mm <sup>2</sup> Au BSM die, K/W:	
on Ag	0.45
on PPF	0.45

**Shear Strength**

Die Shear Strength @ 260 °C:	
1 x 1 mm die, kg-f:	
on Ag	1.5
on Cu	1.6
on PPF	1.2
2 x 2 mm die, kg-f:	
on Ag	5.0
on Cu	6.5
on PPF	4.5
3 x 3 mm die, kg-f:	
on Ag	10.9
on Cu	10.8
on PPF	10.0

**TYPICAL ENVIRONMENTAL RESISTANCE****Outgassing Properties**

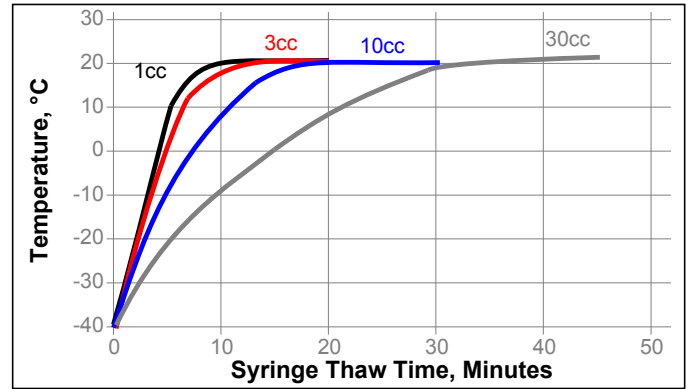
Outgassing , NASA Outgassing:	
TML, %	0.2
CVCM, %	0.02
WVR, %	0.03

**GENERAL INFORMATION**

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

**THAWING:**

1. Allow container to reach room temperature before use.
2. DO NOT open the container before contents reach 25°C temperature. Any moisture that collects on the thawed container should be removed prior to opening the container.

**DIRECTIONS FOR USE**

1. Thawed material should immediately be placed on dispense equipment for use
2. If the adhesive is transferred to a final dispensing reservoir, care must be exercised to avoid entrapment of contaminants and/or air into the adhesive
3. Adhesive must be completely used within the product's recommended work life
4. Bondline thickness guideline
 

Die Size ≤ 3 x 3 mm <sup>2</sup> , BLT control, μm	10 to 25
Die Size > 3 x 3 mm <sup>2</sup> , BLT control, μm	20 to 50

The above BLTs are guideline recommendations. Optimal BLT may vary based on customers' experience and their application requirements as well as customer's package design, die dimension and cure profile.

**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.

**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**

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**

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$   
 $\text{kV/mm} \times 25.4 = \text{V/mil}$   
 $\text{mm} / 25.4 = \text{inches}$   
 $\text{N} \times 0.225 = \text{lb/F}$   
 $\text{N/mm} \times 5.71 = \text{lb/in}$   
 $\text{psi} \times 145 = \text{N/mm}^2$   
 $\text{MPa} = \text{N/mm}^2$   
 $\text{N}\cdot\text{m} \times 8.851 = \text{lb}\cdot\text{in}$   
 $\text{N}\cdot\text{m} \times 0.738 = \text{lb}\cdot\text{ft}$   
 $\text{N}\cdot\text{mm} \times 0.142 = \text{oz}\cdot\text{in}$   
 $\text{mPa}\cdot\text{s} = \text{cP}$

**Disclaimer****Note:**

The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. The product can have a variety of different applications as well as differing application and working conditions in your environment that are beyond our control. Henkel is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product.

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Reference 2