

**LOCTITE HHD 3593**

September 2017

**PRODUCT DESCRIPTION**

LOCTITE HHD 3593 provides the following product characteristics:

<b>Technology</b>	Polyurethane Hot Melt
<b>Appearance</b>	Black Solid
<b>Solids Content, %</b>	100
<b>Components</b>	One part - requires no mixing
<b>Cure</b>	Solidification and Moisture
<b>Application</b>	Device assembly

LOCTITE HHD 3593 is a reactive, black polyurethane hotmelt adhesive formulated to cure with moisture. This adhesive has a long open time and is ideal for automatic or manual assembly line production.

**TYPICAL PROPERTIES OF UNCURED MATERIAL**

Viscosity, Brookfield - Thermosel, 100 °C, mPa·s (cP):  
Spindle 27, speed 20 rpm 5,400  
Density @ 25°C ±0.05, g/cm<sup>3</sup> 1.1  
Shelf Life @ 5 to 25°C (from date of manufacture), 365 days  
Flash Point - See SDS

**TYPICAL CURING PERFORMANCE**

Open Time @ 25 °C, minutes >6  
Preheating Schedule 20 to 30 mins @ 100°C  
Application Temperature, °C 100 to 110

Open time is the bonding range of a 1 mm bead of molten adhesive on substrate. It is based on room temperature environment. Higher temperature will lengthen the open time while lower environmental temperatures will shorten the open time.

LOCTITE HHD 3593 cures exclusively by moisture and gains its final strength in 1-5 days. This material, however, exhibits high handling strength instantly after bonding.

Curing is a chemical reaction depending on the following parameters:

- Humidity in the rooms of application and storage
- Moisture content on the substrates
- Permeability of the substrates to be bonded
- Application volume / layer of the adhesive film

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 PERFORMANCE OF CURED MATERIAL**

Sample cured @ controlled environment 23 ±5°C, relative humidity 50 ±5%.

**Miscellaneous**

Tensile Adhesion @ 100 °C:

3 X 3 mm with 0.127 spacer, Glass to steel:

After 1 hour, N/mm<sup>2</sup> 0.819  
After 24 hours, N/mm<sup>2</sup> 2.42

**GENERAL INFORMATION**

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

**Pretreatment:**

1. The bonding surfaces must be clean, dry and free of oil and grease.
2. Substrate temperature should not fall below 20°C during application.
3. Lower temperatures will lead to early solidification of the adhesive and to a reduced open time, the adhesive might even flake off.
4. The substrates may be preheated if necessary.

**Application:**

1. LOCTITE HHD 3593 can be applied from heating cartridge guns, from usual syringe type melting equipment.
2. At longer rest periods, melting and application temperatures should be decreased. Longer exposure to higher temperatures can lead to a viscosity increase.

**STORAGE:**

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

**Optimal Storage : 5 to 25 °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**

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

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