

LOCTITE[®] HHD 3541[™]

April 2015

PRODUCT DESCRIPTION

LOCTITE[®] HHD 3541[™] provides the following product characteristics:

Technology	Polyurethane Hot Melt
Chemical Type	Reactive Polyurethane
Appearance (uncured)	Ivory to light amber solid
Components	One component - requires no mixing
Viscosity	High
Cure	Solidification and Moisture
Application	Bonding

LOCTITE[®] HHD 3541[™] is a reactive hot-melt adhesive based on polyurethane prepolymers. It is designed for robotic dispensing and has a relatively long open time. Immediately after solidifying in the bond line, the adhesive provides good initial strength. Then the secondary moisture cure cross-links the bonds for excellent elongation and structural durability. Fully cured product does not remelt.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.15
Viscosity, Brookfield - Thermosel, 110 °C, mPa-s (cP):	
Spindle 27	8,000 to 12,500

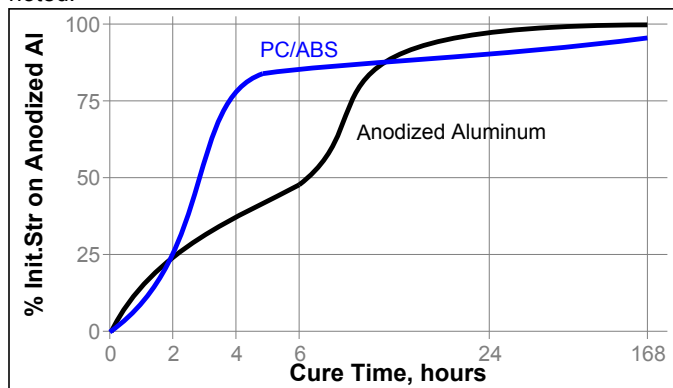
Flash Point - See SDS

TYPICAL CURING PERFORMANCE

Open Time @ 25 °C, minutes, 1 mm bead	<4
Application Temperature, °C	100 to 120

Cure Speed vs. Time

The graph below shows the cross bond tensile strength developed over time at 22 °C / 50 % RH on the substrates noted.



TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties:

Glass Transition Temperature, ISO 11359-2, °C	-32
Coefficient of Thermal Expansion, ISO 11359-2, K ⁻¹ :	
Pre Tg	160×10 ⁻⁶
Post Tg	270×10 ⁻⁶
Shore Hardness, ISO 868, Durometer D	32
Coefficient of Thermal Conductivity ASTM E 0.23 1530, W/(m·K)	
Elongation, at break, ISO 527-2, %	590
Tensile Strength, ISO 527-2	N/mm ² 17 (psi) (2,440)
Tensile Modulus, ISO 527-2	N/mm ² 110 (psi) (15,990)

Electrical Properties:

Dielectric Constant, IEC 60250:	
@ 1,000 KHz	3.75

TYPICAL PERFORMANCE OF CURED MATERIAL

Cured for 7 days @ 22 °C

Lap Shear Strength, ISO 4587:	
Aluminum (anodised)	N/mm ² 5.0 (psi) (725)
PC/ABS	N/mm ² 5.4 (psi) (785)

Cross bond performance is determined by stressing a bonded assembly with the application of force perpendicular to the bond area and to the major axis of the test specimen.

Crossbond tensile loading strength:

Aluminum (anodised)	N/mm ² 6.3 (psi) (915)
PC/ABS	N/mm ² 5.8 (psi) (860)

TYPICAL ENVIRONMENTAL RESISTANCE

Crossbond tensile loading strength:

Anodized Aluminum

After 7 days @ 85 °C / 85% RH	N/mm ² 5.9 (psi) (855)
After Thermal Cycling*	N/mm ² 6.0 (psi) (870)
After Heat Shock**	N/mm ² 4.1 (psi) (595)

Chemical/Solvent Resistance

aged under conditions indicated and tested @ 22°C

Environment	°C	% of initial strength	
		500 h	1000 h
Air	87	110	110
Motor oil	87	130	130
Isopropanol	22	55	55
Water	22	75	75
Acetone	22	10	10

Crossbond tensile loading strength:
PC/ABS

After 7 days @ 85 °C / 85% RH

N/mm² 6.2
(psi) (900)

After Thermal Cycling*

N/mm² 6.0
(psi) (870)

After Heat Shock**

N/mm² 3.8
(psi) (545)

Chemical/Solvent Resistance

aged under conditions indicated and tested @ 22°C

Environment	°C	% of initial strength	
		500 h	1000 h
Air	87	105	135
Motor oil	87	125	145
Isopropanol	22	65	65
Water	22	115	100
Water/glycol	87	110	90

***Thermal Cycle Resistance**

27 cycles: 25°C / 95%RH to 65°C / 95%RH (1.5 hr ramp), dwell 4 hours, 65°C / 95%RH to 30°C / 95%RH (1.5 hour ramp), dwell 1 hour

****Heat Shock Resistance**

20 cycles: 1 hour 85°C then 1 hour at -40°C (ramp <3 min)

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 Safety Data Sheet (SDS).

Directions for use:

1. For high strength structural bonds, remove surface contaminants such as paint, oxide films, oils, dust, mold release agents and all other surface contaminants.
2. Use gloves to minimize skin contact. DO NOT use solvents for cleaning hands.
3. After heating to recommended application temperature, apply an adequate amount of adhesive to one of the bond surfaces.
4. Join the substrates within the specified open time.
5. Keep parts from moving until adhesive is adequately set. For high strength, allow to cure at 22°C for 24 hours.

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: 8 °C to 21 °C. Storage below 8 °C or greater than 28 °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

(°C x 1.8) + 32 = °F
kV/mm x 25.4 = V/mil
mm / 25.4 = inches
µm / 25.4 = mil
N x 0.225 = lb
N/mm x 5.71 = lb/in
N/mm² x 145 = psi
MPa x 145 = psi
N·m x 8.851 = lb·in
N·m x 0.738 = lb·ft
N·mm x 0.142 = oz·in
mPa·s = cP

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.

Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

In case products are delivered by Henkel Belgium NV, Henkel Electronic Materials NV, Henkel Nederland BV, Henkel Technologies France SAS and Henkel France SA please additionally note the following:

In case Henkel would be nevertheless held liable, on whatever legal ground, Henkel's liability will in no event exceed the amount of the concerned delivery.

In case products are delivered by Henkel Colombiana, S.A.S. the following disclaimer is applicable:

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. 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.

Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

In case products are delivered by Henkel Corporation, Resin Technology Group, Inc., or Henkel Canada Corporation, the following disclaimer is applicable:

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

Except as otherwise noted, all trademarks in this document are trademarks of Henkel Corporation in the U.S. and elsewhere. ® denotes a trademark registered in the U.S. Patent and Trademark Office.

Reference 0.2