

PRODUCT DESCRIPTION

Loctite® 3D 3860™ is a black colored light curing acrylic resin that may be used for functional prototyping via stereolithography. Loctite® 3D 3860™ cures with very short exposure to monochromatic light sources such as LED or Laser. Printed articles made from Loctite® 3D 3860™ exhibit high heat deflection temperature (HDT) and good print resolution. Loctite® 3D 3860™ is a low viscosity liquid that is printable at room temperature across various Laser SLA and DLP Platforms.

Loctite® 3D 3860™ provides the following product characteristics:

Technology	Stereolithography Resin
Appearance	Black opaque liquid ^{LMS}
Chemical Type	Acrylic
Odor	Mild
Cure	Ultraviolet (UV)/ Visible light
Viscosity	Low
Application	Functional Prototyping
Specific Benefits	<ul style="list-style-type: none"> • Good print resolution • Short exposure times • High HDT • Low Shrinkage • Rigid

TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity g/cm³@ 25°C 1.1^{LMS}

Flash Point - See MSDS

Viscosity, Cone & Plate, mPa*s (cP):
 Temperature: 25C, Shear Rate: 200 s⁻¹ 300-400^{LMS}

TYPICAL CURING PERFORMANCE

Loctite® 3D 3860™ can be cured by exposure to UV and Visible light of sufficient intensity and wavelength. Cure rate and ultimate depth of cure depend on light intensity, spectral distribution of the light source, exposure time and light transmittance of the printer window through which the light must pass. Loctite® 3D 3860™ will cure with DLP and Lasers ranging from 300-450nm.

The following working curve values were determined using a DLP printer at 405nm wavelength;

Measurement	Unit	Value
Critical Exposure (E _c)	mJ/cm ²	9.08
Penetration Depth (D _p)	mm	0.162

TYPICAL PROPERTIES OF CURED MATERIAL

All data is recorded on specimens printed in the XY plane at 0.050mm layer thickness on a DLP printer at 405nm. Some variation is expected when printing in the Z plane. The physical properties in the table below are reflective of what one may observe under the noted conditions. Contact your local Loctite Technical Service team for further information.

Physical Property	Unit	As Printed	Post Processed*
Elongation, at break, ASTM D638	%	2-6	1-2
Tensile Strength, ASTM D638	MPa	31-38	37-41
	ksi	4.5-5.5	5.4-5.9
Tensile Modulus, (Secant 0.002), ASTM D638	Gpa	1.7-1.9	3.0-4.0
	ksi	246-275	435-580
Heat Deflection Temperature (0.45Mpa) ASTM D648	°C	55-58	180-190
Volume Shrinkage	%	-	6.5
Linear Shrinkage, ASTM D792	%	-	2.2
Shore Hardness, ASTM D2240, Durometer D	-	-	80

* Samples were exposed for 200 seconds per side @ 68% intensity using a Loctite® CL36™ cure chamber, followed by 30 minutes in an oven preheated to 160°C.

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:

- This product is light sensitive; exposure to daylight, UV light and artificial lighting should be kept to a minimum during storage and handling.
- **Shake or stir Loctite® 3D 3860™ well before use.**
 - Agitate resin before each print
 - Do not leave resin in printer tray when not in use
- Post Print Processing:
 - Rinse the printed part using an approved cleaner to remove uncured resin

Loctite Material Specification^{LMS}

Test reports for each batch are available for the indicated properties. LMS test reports include selected QC test parameters considered appropriate to specifications for customer use.

Additionally, comprehensive controls are in place to assure product quality and consistency. Special customer specification requirements may be coordinated through Henkel Quality.

Storage

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

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 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 Centre or Customer Service Representative.

Conversions

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

Note

The 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 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, Inc. 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."