Version 2023/02/21

LOCTITE 3D 3860™

HDT180 High Temperature Photoplastic Black

LOCTITE®
Henkel Corporation
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LOCTITE®

3860™

HDT180 HIGH TEMPERATURE
PHOTOPLASTIC
BLACK

LOCTITE 3D 3860™

LOCTITE 3D 3860 is a rigid resin that withstands high temperature stress and it is ideal for applications where high resolution and high HDT is required

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, printable at room temperature across various DLP Platforms.

Benefits:

- No deformation, more durable
- Survives longer to temperature stress
- Easy to print with high print resolution

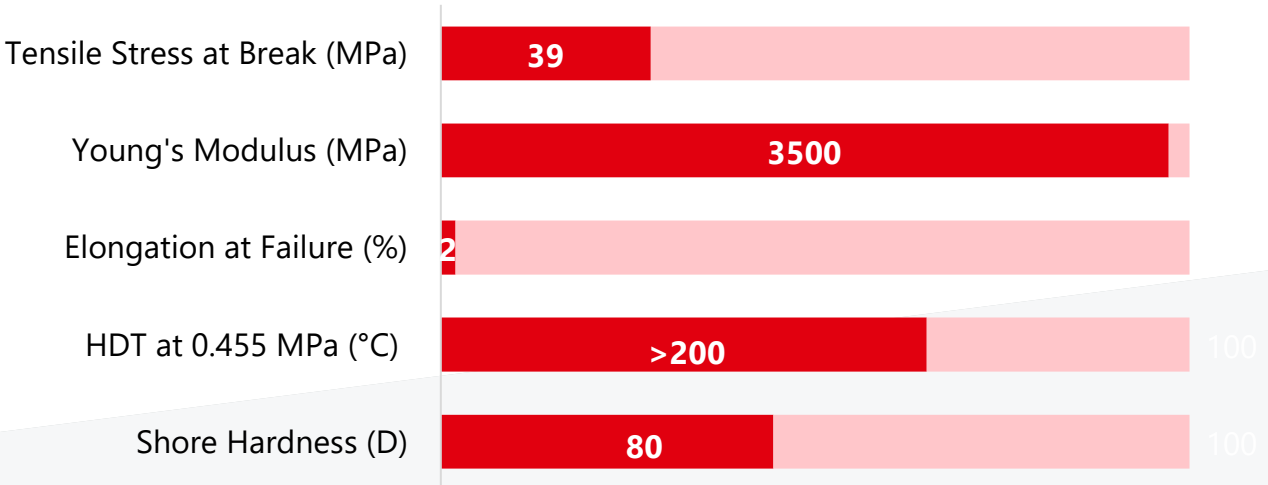
Ideal for:

- Functional prototyping
- Encapsulation
- Mounts and housings

Markets:

Industry

Automotive



**Values shown are linked to LOCTITE 3860 Black as reference, please refer to the specific mechanical properties for each of the colors shown in this document*

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PROPERTIES

Mechanical Properties	Measure	Method	Green	Post Processed
Tensile Stress at Break	MPa	ASTM D638	35	39
Young's Modulus	MPa	ASTM D638	1800	3500
Elongation at Failure	%	ASTM D638	4	2
Flexural Modulus	MPa	ASTM D790	-	3190 ± 60 [1]
Flexural Stress at Break	MPa	ASTM D790	-	40.0 ± 4.0 [1]
Flexural Strain at Break	%	ASTM D790	-	1.2 ± 0.1 [1]
Shore Hardness	D	ASTM D2240	-	80
Other Properties				
HDT at 0.455 MPa	°C	ASTM D648	-	>200 [2]
HDT at 1.82 MPa	°C	ASTM D648		166 ± 5 [2]
Thermal conductivity	mW/(m·K)	ASTM D5930	-	193
Specific heat capacity	J/(g·K)	ASTM D5930	-	1.21

Liquid Properties	Measure	Method	Value
Viscosity at 25°C (77°F)	mPa·s	ASTM D7867	400
Liquid Density	g/cm^3	ASTM D1475	1.1

"All specimen are printed unless otherwise noted. All specimen were conditioned in ambient lab conditions at 19-23C / 40-60% RH for at least 24 hours." ASTM Methods: D638 Type IV, 5mm/min, D790-B, 2mm/min, D256 Notched IZOD (Machine Notched), 6 mm x 12 mm, D648, D2240, Type "D" (0, 3 seconds), D570 0.125" x 2" Disc 24hr@ 25°C, D7867@ 25°C (77°F), D1475

Internal Data Sources:
[1] FOR175733 [2] FOR176283

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WORKFLOW

Validated workflows need to be followed to achieve properties as provided in the TDS. Examples of validated workflow steps are listed below. Users should defer to the most current workflow information for best results which can be found at https://www.loctiteam.com/printer-validation-settings

PRINTER SETTINGS

LOCTITE 3D 3860 BK is formulated to print optimally on industrial DLP printer. Read the safety data sheet carefully to get details about health and safety instructions. Recommended print parameters:

- Shake resin bottle well before usage
- Temperature: 20°C to 35°C
- Intensity: 3 mW/cm² to 7 mW/cm²

Exposure time for an intensity of 5 mW/cm²

Layer Thickness (µm):	25	50	100
First layer time (s)	Available upon request		
Burn in region (s):			

Ec (mJ/cm²)	9.08
Dp (mm):	0.162

CLEANING

LOCTITE 3D 3860 BK requires post processing to achieve specified properties. Prior to post curing, support structures should be removed from the printed part, and the part should then be washed. Use compressed air to remove residual solvent from the surface of the material between intervals.

Post Process Step	Agent	Method	Duration	Intervals	Additional Info
Cleaning	IPA	Ultrasonic	1-2 min	1-2	
Dry	n.a.	Compressed air	20 s	1	Air pressure (20 psi)
Wait before post curing	n.a.	Ambient condition	60 min	1	Room temperature

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POST CURING

LOCTITE 3D 3860 BK requires post curing to achieve specified properties. It is recommended that either an LED or wide spectrum lamp be used to post cure parts.

UV Curing Unit	UV Source	Intensity	Cure time per side	Additional Settings (Shelf, Output Energy)
Loctite – CL36	LED 405 nm	85 mW/cm^2	20 min	100% Top and Side

LOCTITE 3D 3860 BK requires a **thermal curing cycle** after UV post curing to achieve specified properties. It is recommended to place parts in an unheated oven. Heat up to 160°C to cure the parts for 30 minutes. Switch off oven and allow parts to cool down in oven to prevent stress and warpage.

STORAGE

Store LOCTITE 3D 3860 BK in the unopened container in a dry location. Optimal Storage: 8°C to 30°. Storage below 8°C or above 30°C can adversely affect product properties. Material removed from containers may be contaminated during use. For this reason, filter used resin with 190µm mesh filter before placing back into proper storage container.

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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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