

# **LOCTITE®**

## **3172™**

**PhotoPlastic**

**HDT50 High Impact**

**Gray**

**LOCTITE®**  
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Concord CA 94520

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**Preliminary v3.3**



# 3172™ HDT50 High Impact

## Description

LOCTITE® Engineering Grade products are high performance fluids developed to be highly consistent with extraordinary attributes. LOCTITE® 3172™ is a very strong and durable photopolymer with mechanical attributes similar to polypropylene. LOCTITE® 3172™ displays fantastic elongation, impact strength, and compression strength. Parts manufactured with LOCTITE® 3172™ can be machined, tapped, or polished. This product should only be printed on a DLP machine.

LOCTITE® 3172™ has been tested in QUV exterior weathering conditions (ASTM G-154) for 800 hours with less than a 15% change in Tensile and IZOD Impact properties. <sup>[14]</sup>

Available Colors: Gray, Clear

Mechanical Properties	Method	Green	Post Processed
Tensile Strength at Break	ASTM D638	36.0 ± 3.6 MPa <sup>[9]</sup>	49.5 ± 2.9 MPa <sup>[1]</sup>
Tensile Stress at Yield	ASTM D638	31.3 ± 1.4 MPa <sup>[9]</sup>	44.8 ± 0.8 MPa <sup>[1]</sup>
Young's Modulus	ASTM D638	986 ± 82.6 MPa <sup>[9]</sup>	1385 ± 94 MPa <sup>[1]</sup>
Elongation at Failure	ASTM D638	136 ± 20 % <sup>[9]</sup>	108 ± 12 % <sup>[1]</sup>
Flexural Stress at Yield	ASTM D790	33.1 ± 0.7 <sup>[10]</sup>	53 ± 1.5 MPa <sup>[2]</sup>
Flexural Modulus	ASTM D790	737 ± 22.3 <sup>[10]</sup>	1150 ± 35 MPa <sup>[2]</sup>
Flexural Strain at Break	ASTM D790	>10% <sup>[10]</sup>	>10% <sup>[2]</sup>
<b>Other Properties</b>			
IZOD Impact Strength (Notched)	ASTM D256		73.2 ± 4.2 J/m <sup>[3]</sup>
IZOD Impact Strength (Unnotched)	ASTM D256		No break <sup>[8]</sup>
HDT @ 0.455 MPa	ASTM D648		52 °C <sup>[4]</sup>
Thermal Conductivity	ASTM D5930		0.20 W/m*K <sup>[7]</sup>
Heat Capacity	ASTM D5930		1.68 J/g*K <sup>[7]</sup>
Shore Hardness (0, 3 seconds)	ASTM D2240	65D, 57D <sup>[12]</sup>	72D, 63D <sup>[11]</sup>
Water Absorption (24 hr)	ASTM D570		1.46% <sup>[5]</sup>
Water Absorption (168 hr)	ASTM D570		3.10% <sup>[5]</sup>
Solid Density (Green)	ASTM D1475	1.13 <sup>[13]</sup>	
Solid Density (Post Processed)	ASTM D1475		1.15 <sup>[13]</sup>

### Liquid Properties

Viscosity @ 25°C (77°F)	ASTM D7867	2000 ± 150 cP <sup>[6]</sup>
Liquid Density	ASTM D1475	1.06 g/cm <sup>3</sup> <sup>[13]</sup>

"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, 50 mm/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, D1475, D7867@ 25°C (77°F)

- TaskID Reference: FOR19843
- TaskID Reference: FOR17820
- TaskID Reference: FOR19120
- TaskID Reference: FOR19863
- TaskID Reference: FOR19125

- TaskID Reference: FOR17826
- TaskID Reference: FOR19231
- TaskID Reference: FOR19121
- TaskID Reference: FOR19844
- TaskID Reference: FOR19128

- TaskID Reference: FOR19124
- TaskID Reference: FOR19123
- TaskID Reference: FOR17968
- External Lab Tested

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## Machine Settings

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LOCTITE® 3172™ is formulated to print optimally on any DLP machine. It is recommended to print with 405 nm wavelength projectors with irradiance between 3-7 mW/cm<sup>2</sup>. Layer time is given below at 6 mW/cm<sup>2</sup>:

Layer Thickness:	25 µm	50 µm	100 µm		
Base Cure Time:	45 s	45 s	45 s	Ec (mJ/cm <sup>2</sup> )	18.5
Model Layer Cure Time:	2 s	3.5 s	6 s	Dp (mm):	0.477

Recommended printing Temperature range: 20°C to 45°C

## Post Processing

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LOCTITE® 3172™ requires post processing to achieve specified properties. Prior to post curing, support structures should be removed from the printed part, and the part should be washed in a compatible cleaner. LOCTITE® recommends either IPA or Cleaner C in 2 minute interval wash cycles. Use compressed air to remove residual solvent from the surface of the material between intervals. Exact times and methods can be found by contacting us at [www.loctiteAM.com](http://www.loctiteAM.com).

## Post Curing

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LOCTITE® 3172™ requires post curing to achieve specified properties. A wide array of post cure devices can be used to cure appropriately. See Validation chart for examples of type and time. Exact devices with detail information can be found by contacting us at [www.loctiteAM.com](http://www.loctiteAM.com)

## Additional Development Options

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Colors: LOCTITE® 3172™ formula is made with additional pigment colors.

Formula Modification LOCTITE® 3172™ has potential for tensile property adjustments.

## Limitations

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Post Cure: LOCTITE® 3172™ requires a UV/Visible light post cure.

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## Note

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