

LOCTITE®

3172™

PhotoPlastic

HDT40 High Impact

Clear

LOCTITE®
5110 Port Chicago Hwy
Concord CA 94520

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Preliminary v2.1



3172™ HDT40 High Impact Clear

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.

Available Colors: Gray, Clear

Mechanical Properties	Method	Green	Post Processed
Tensile Strength at Break	ASTM D638	14.5 ± 1 MPa ^[1]	38 ± 1.4 MPa ^[8]
Tensile Stress at Yield	ASTM D638	9.5 ± 1 MPa ^[1]	29.36 ± 1.3 MPa ^[8]
Young's Modulus	ASTM D638	209 ± 64 MPa ^[1]	1245 ± 43 MPa ^[8]
Elongation at Failure	ASTM D638	141 ± 4 % ^[1]	141 ± 4% ^[8]
Flexural Stress at Yield	ASTM D790		37.6 ± 2.56 MPa ^[7]
Flexural Modulus	ASTM D790		1022 ± 76 MPa ^[7]
Flexural Strain at Break	ASTM D790		>10% ^[7]
Other Properties			
IZOD Impact Strength (Notched)	ASTM D256		42.6 ± 5 J/m ^[9]
IZOD Impact Strength (Unnotched)	ASTM D256		
HDT @ 0.455 MPa	ASTM D648		40°C ^[10]
Shore Hardness	ASTM D2240		70D ^[6]
Water Absorption	ASTM D570		0.36% ^[5]
Solid Density (Green)	ASTM D1475	1.128 ^[11]	1.128 ^[3]
Solid Density (Post Processed)	ASTM D1475		1.137 ^[3]

Liquid Properties

Viscosity @ 25°C (77°F)	ASTM D7867	637 ± 150 cP ^[2]
Liquid Density	ASTM D1475	1.063 ^[3]

"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, D1475, D7867@ 25°C (77°F)

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| 2. TaskID Reference: FOR17057 | 8. TaskID Reference: FOR17060 |
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| 5. TaskID Reference: FOR17058 | 11. TaskID Reference: FOR20003 |
| 6. TaskID Reference: FOR17572 | 12. TaskID Reference: FOR20004 |



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Machine Settings

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/cm². Layer time is given below at 6 mW/cm²:

Layer Thickness:	25 µm	50 µm	100 µm		
Base Cure Time:	45 s	45 s	45 s	Ec (mJ/cm ²)	7.4
Model Layer Cure Time:	2 s	3.5 s	6 s	Dp (mm):	0.15

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

Post Processing

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.

Post Curing

LOCTITE® 3172™ requires post curing to achieve specified properties. A wide array of post cure equipment can be used to cure appropriately. Exact devices with detailed information can be found by contacting us at www.loctiteAM.com.

Additional Development Options

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

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

Limitations

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

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Clear Color Properties

Method: ASTM E308, Total Transmission

Part State	L*	a*	b*	C*	h	dE
Green / no post-processing ^[11]	90.83	-1.2	2.45	2.72	116.12	NA
Dymax 5000EC 5 minutes / side ^[11]	89.74	-0.37	1.23	1.28	106.6	1.834503
Loctite CL36 30min/side ^[12]	89.57	-0.23	0.73	0.77	107.63	2.342413

QUV exterior weathering conditions (ASTM G-154—Cycle 1): Clear Color Mechanical Properties

Method: ASTM G-154—Cycle 1

QUV Exposure Time (Hrs)	Tensile Stress at break (MPa)	Yield Stress (MPa)	Young's Modulus (MPa)	Elongation at break (%)
0	37 ± 1.2	29.0 ± 1.5	1250 ± 40	140 ± 3
24	36.5 ± 3	26.5 ± 2	1140 ± 75	143 ± 10
192	31.8 ± 2	23.2 ± 0.5	1050 ± 14.5	141 ± 16
325	28.4 ± 3	33.0 ± 0.8	1400 ± 33.2	82 ± 30
650	26.5 ± 1	27.0 ± 0.5	1301 ± 29.5	100 ± 5

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Note

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