

# **LOCTITE®**

## **IND403™**

**PhotoPlastic**

**HDT80**

**High Modulus**

**LOCTITE®**  
5110 Port Chicago Hwy  
Concord CA 94520

**07/20/2020**

**Preliminary v3.3**



# IND403™ HDT80 High Modulus

## Description

LOCTITE® 3D IND403™ is a high temperature resistance material that showcases high surface quality and outstanding dimensional accuracy, making it ideal for tooling production for low temperature processes (below 80°C). The material is able to withstand mechanical stresses while maintaining dimensional stability, which makes it a good candidate for interior applications.

Available Colors: Black (Other color upon request)

Mechanical Properties	Method	Green	Post Processed
Tensile Stress at Break (MPa)	ASTM D638	46.5 ± 2.5 [6]	87 ± 3 [5]
Tensile Stress at Yield (MPa)	ASTM D638	56.1 ± 8 [6]	91 ± 2 [5]
Young's Modulus (MPa)	ASTM D638	2176 ± 72 [6]	2750 ± 65 [5]
Elongation at Failure (%)	ASTM D638	15 ± 10 [6]	8.5 ± 2 [5]
Maximum Flexural Stress (MPa)	ASTM D790	81 ± 2 [2]	136 ± 1.5 [1]
Flexural Modulus (MPa)	ASTM D790	1879 ± 34 [2]	2880 ± 50 [1]
Flexural Strain at Break (%)	ASTM D790	>10 [2]	>10 [1]
Impact Strength—IZOD Notched	ASTM D256		27.2 ± 4.7 [8]
Impact Strength—IZOD Unnotched	ASTM D256		>250 [9]
<b>Other Properties</b>			
Hardness—Shore D (0, 3 Seconds)	ASTM D2240	81D, 76D [3]	80D, 78D [4]
Solid Density	ASTM D1475	1.17 g/cm <sup>3</sup> [10]	1.20 g/cm <sup>3</sup> [11]
Volumetric Shrinkage	Internal	8.67% [10]	10.99% [11]
Thermal Conductivity	ASTM D5930		0.22 W/m*K [12]
Heat Capacity	ASTM D5930		1.35 J/g*K [12]
Heat Deflection Temperature @ 0.455 MPa	ASTM D648	64 ± 1.6°C [15]	81.7 ± 1°C [16]
Heat Deflection Temperature @ 1.82 MPa	ASTM D648		64.7°C [17]
<b>Liquid Properties</b>			
Viscosity @ 25°C (77°F)	ASTM D7867	100—200 cP [7]	
Liquid Density	ASTM D1475	1.08 g/mL [18]	

"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, D2240, Type "D" (0, 3 seconds), D7867, D1475

1. TaskID Reference: FOR16922
2. TaskID Reference: FOR16923
3. TaskID Reference: FOR16912
4. TaskID Reference: FOR16911
5. TaskID Reference: FOR16917
6. TaskID Reference: FOR16916

7. TaskID Reference: FOR16921
8. TaskID Reference: FOR16913
9. TaskID Reference: FOR16914
10. TaskID Reference: FOR16928
11. TaskID Reference: FOR16928
12. TaskID Reference: FOR19229

13. TaskID Reference: Removed
14. TaskID Reference: FOR16924
15. TaskID Reference: FOR16918
16. TaskID Reference: FOR19730
17. TaskID Reference: FOR16920
18. TaskID Reference: FOR16910

19. TaskID Reference: FOR16928
20. TaskID Reference: Removed
21. TaskID Reference: FOR16915
22. TaskID Reference: FOR12108



# IND403™ HDT80 High Modulus

## Machine Settings

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LOCTITE® IND403™ is formulated to print optimally on industrial DLP technology. It is recommended to print with a 385nm [or 405nm if preferred] wavelength projector with an irradiance between 3-7 mW/cm<sup>2</sup>. Layer time is given below at 6 mW/cm<sup>2</sup>:

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

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

## Post Processing

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LOCTITE® IND403™ 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® IND403™ requires post curing to achieve specified properties. A wide array of post cure equipment can be used to cure appropriately. 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® IND403™ formula can be made in additional pigment colors.

Formula Modification LOCTITE® IND403™ are possible.

LCD printers: LOCTITE® IND403™ more development needed but could be possible with clear resin formulation.

## Limitations

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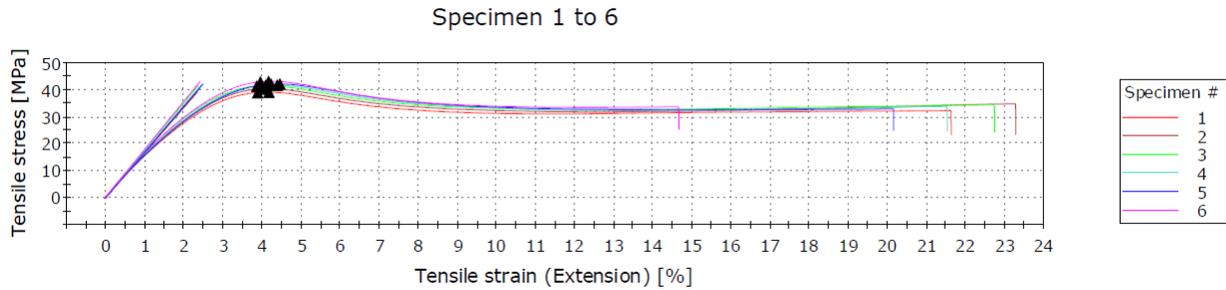
Vat Printer: LOCTITE® IND403™ has not been tested.



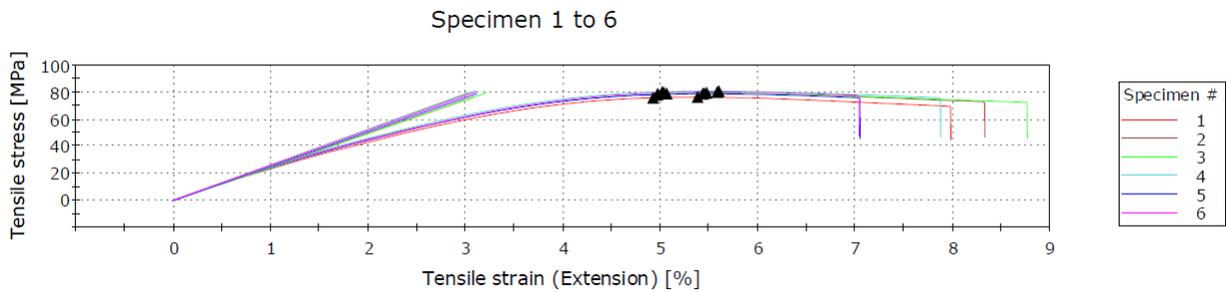
# IND403™ HDT80 High Modulus

## Supplemental Data

### Green—Tensile

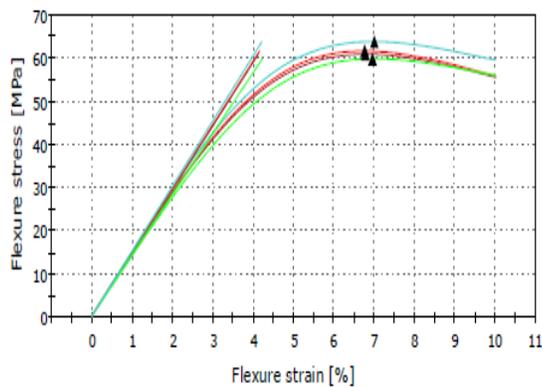


### Post Cured—Tensile



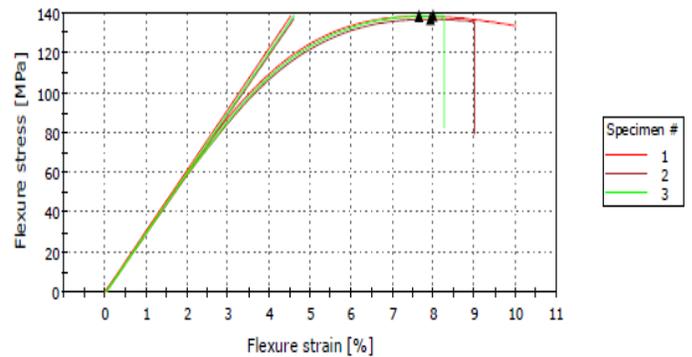
### Green—Flexural

Specimen 1 to 4



### Post Cured—Flexural

Specimen 1 to 3



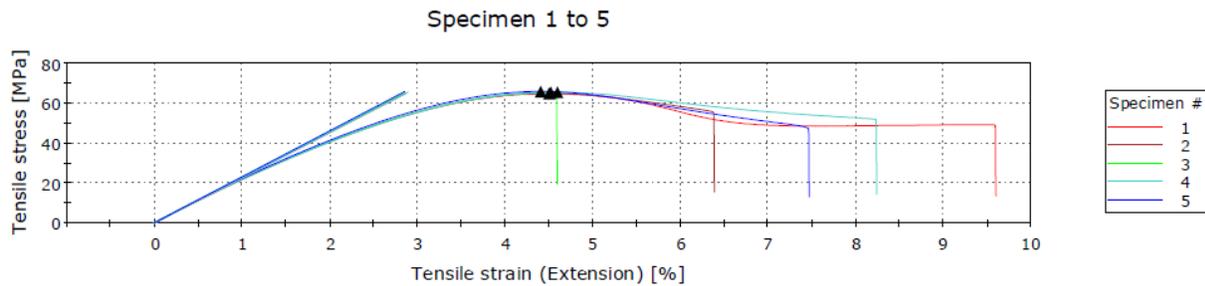
# IND403™ HDT80 High Modulus

## Supplemental Data

### Green—Tensile



### Post Cured—Tensile



# IND403™ HDT80 High Modulus

## (<sup>Note</sup>High Modulus)

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