

**LOCTITE®**



# LOCTITE® 3D IND406™

HDT100 High Elongation  
Photoplastic  
Black

**LOCTITE®**

Henkel Corporation

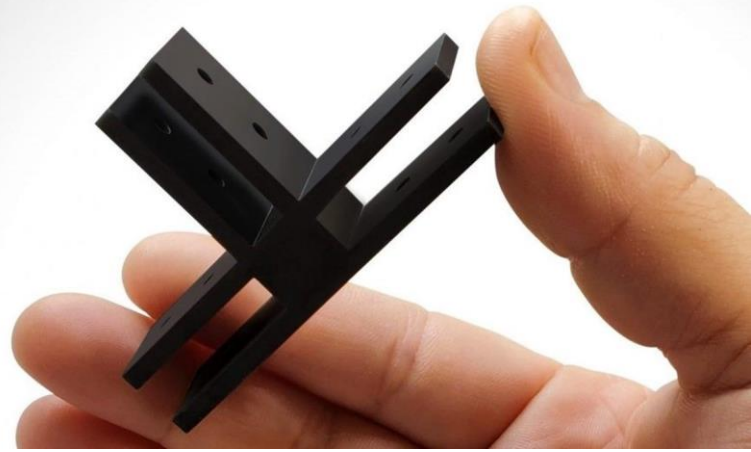
[loctite3dp@henkel.com](mailto:loctite3dp@henkel.com)



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## IND406™

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BLACK



## LOCTITE 3D IND406™

### Our toughest High Temperature Resin

LOCTITE 3D IND406 is a high-strength, high elongation engineering plastic with good impact and high temperature resistance.

Stiffness, toughness and thermal durability make this material ideal for a wide variety of tools in the production floor and for final parts production in Automotive interior and manufacturing. The product is ideal for fixtures, interior and machinery parts.

LOCTITE 3D IND406 can be printed in various DLP printers and parts can be machined, tapped, or polished for final finish.



#### Benefits:

- High heat deflection temperature
- Tough and durable
- Good surface finish



#### Ideal for:

- Interior applications in automotive
- Tooling and fixtures
- Machinery components



#### Markets:



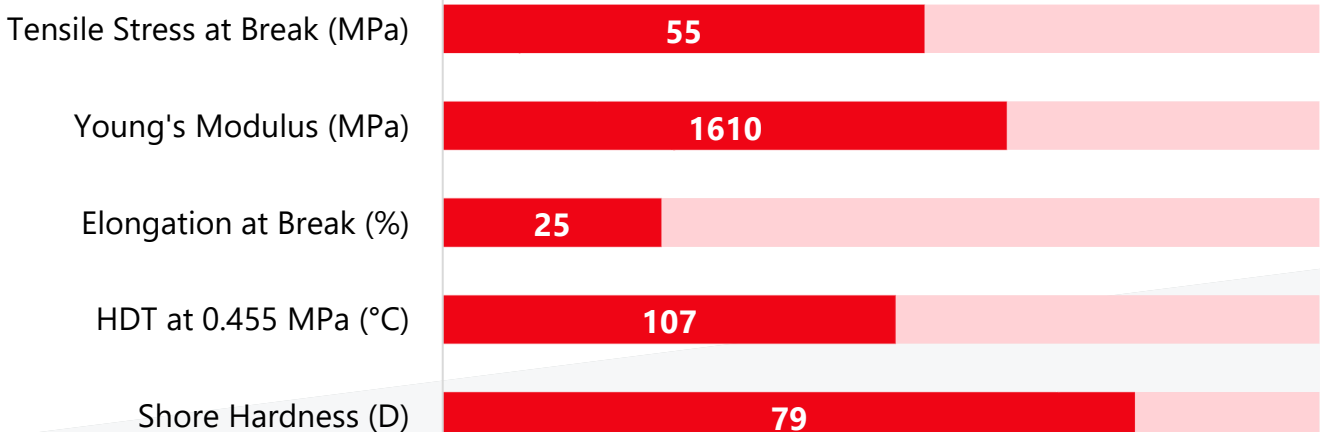
Industry



Automotive



Consumer  
Goods



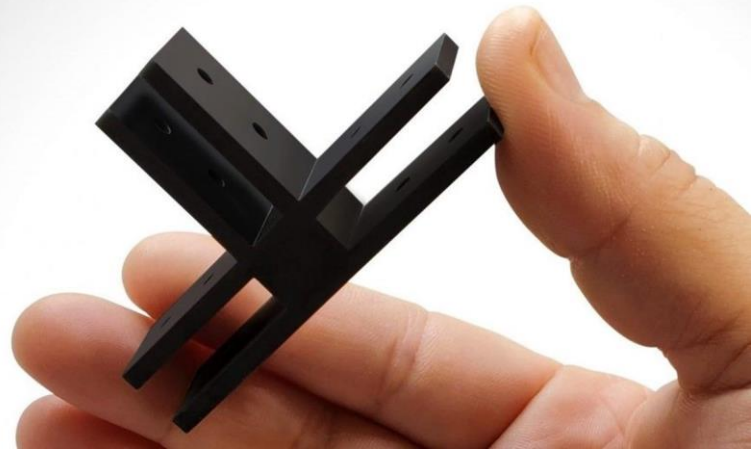
*\*Values shown are linked to LOCTITE IND406 Black as reference, please refer to the specific mechanical properties for each of the colors shown in this document*



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## PROPERTIES

Mechanical Properties	Measure	Method	Green	Post Processed
Tensile Stress at Break	MPa	ASTM D638	17 ± 3 [1]	55 ± 1 [16]
Young's Modulus	MPa	ASTM D638	360 ± 50 [1]	1610 ± 40 [16]
Elongation at Break	%	ASTM D638	40 ± 6 [1]	25 ± 4 [2]
IZOD Impact Strength (Notched)	J/m	ASTM D256	75 ± 4 [3]	35 ± 8 [4]
Shore Hardness	D	ASTM D2240	57 ± 1 [6]	79 ± 1 [7]

Thermal Properties	Measure	Method	Green	Post Processed
HDT at 0.455 MPa	°C	ASTM D648	-	107 ± 1 [5,17]
HDT at 1.82 MPa	°C	ASTM D648	-	81 ± 2 [5,17]
Thermal Conductivity	mW/m·K	ASTM D5930-01	-	206 ± 3 [14]
Heat Capacity	J/(g·K)	ASTM D5930-01	-	1.46 ± 0.04 [14]
Horizontal flame spread speed (1.4 mm thickness)	mm/min	DIN 75200	-	28 (Pass) [15]

Other Properties	Measure	Method	Green	Post Processed
Viscosity at 25°C (77°F)	cP	ASTM D7867	-	1060 [10]
Water Absorption (24 h)	%	ASTM D570	-	1.4 [8]
Water Absorption (72 h)	%	ASTM D570	-	2.6 [9]
Solid Density	g/cm <sup>3</sup>	ASTM D792	-	1.19 [18]
Liquid Density	g/cm <sup>3</sup>	ISO 1675	-	1.10 [18]

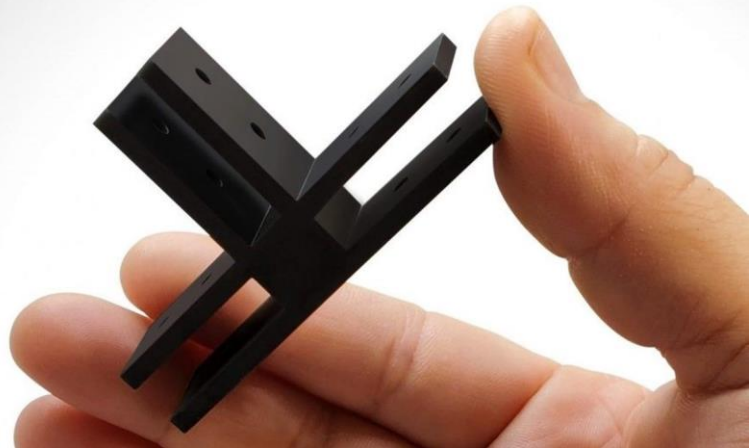
\*All specimen are printed unless otherwise noted. All specimen were conditioned in ambient lab conditions at 19-23°C / 40-60% RH for at least 24 hours.\* ASTM Methods: D638 Type IV, 5 mm/min; D256 Notched IZOD (Machine Notched), D648; D2240, Type "D" (0, 3 seconds); D570, 0.125" x 2" Disc, samples were dried at 50 °C for 24h; D7867@ 25°C (77°F).



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## PROPERTIES

Electrical Properties	Measure	Method	Green	Post Processed
Dielectric Strength	kV/mm	ASTM D149	-	26.0 ± 0.3 [13]
Volume Resistance	Ω·cm	ASTM D257	-	4.5 ± 0.6 E+15 [12]
Surface Resistance	Ω	ASTM D257	-	1.1 ± 0.6 E+15 [12]
<b>AC Relative Permittivity (Dielectric Constant) [11]</b>				
at 50 Hz	none	ASTM D150	-	3.6
at 1 kHz	none	ASTM D150	-	3.4
at 1 MHz	none	ASTM D150	-	3.1
<b>AC Loss Characteristics (Dissipation Factor) [11]</b>				
at 50 Hz	none	ASTM D150	-	0.014
at 1 kHz	none	ASTM D150	-	0.019
at 1 MHz	none	ASTM D150	-	0.022
<b>Biocompatibility</b>				
Cytotoxicity		ISO10993-5		Comply <sup>[19]</sup>
Irritation		ISO10993-23*		Comply <sup>[20]</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, 5 mm/min; D256 Notched IZOD (Machine Notched), D648; D2240, Type "D" (0, 3 seconds); D570, 0.125" x 2" Disc, samples were dried at 50 °C for 24h; D7867@ 25°C (77°F).

\*The biological assessment has been performed based on the in vitro method according to ISO10993-23

### Internal Data Sources:

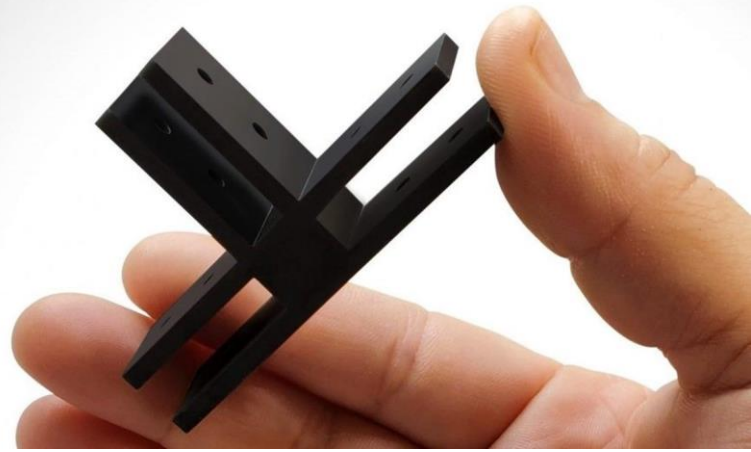
[1]FOR34521, [2]FOR34437, [3]FOR20571, [4]FOR20572, [5]FOR33203, [6]FOR20367, [7]FOR20368, [8]FOR22529, [9]FOR22668, [10]FOR20806, [11]FOR25882, [12]FOR25880, [13]FOR25881, [14] FOR26105, [15] FOR30899, [16] FOR33166, [17] FOR33204, [18] FOR47937, [19] FOR27757, [20] FOR52821 (in-vitro)



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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 IND406 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/cm<sup>2</sup> to 7 mW/cm<sup>2</sup>

### Exposure time for an intensity of 4-7 mW/cm<sup>2</sup>

Layer Thickness (µm):	100	Ec (mJ/cm <sup>2</sup> )	6.45
First layer time (s)	40	Dp (mm):	0.28
Model Layer Cure Time (s):	6		

## POST PROCESSING

LOCTITE 3D IND406 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	Interval	Additional Info
Cleaning	IPA	Ultra sonic bath	3 min	1	Allow parts to dry between intervals
Dry	-	Compressed air	10 to 60 s	1 or 2	Air pressure (50 psi)
Wait before post curing	-	Ambient condition	60 min	1	Room temperature

## POST CURING

LOCTITE 3D IND406 requires post curing to achieve specified properties. It is recommended that a wide spectrum lamp is used to post cure parts.

UV Curing Unit	UV Source	Intensity	Cure time/ side	Additional Settings (Shelf, Output Energy)
Loctite UVALOC 1000	Mercury Arc Bulb (broad spectrum)	30 mW/cm <sup>2</sup> at 365 nm	10 min	1000 W, lowest shelf

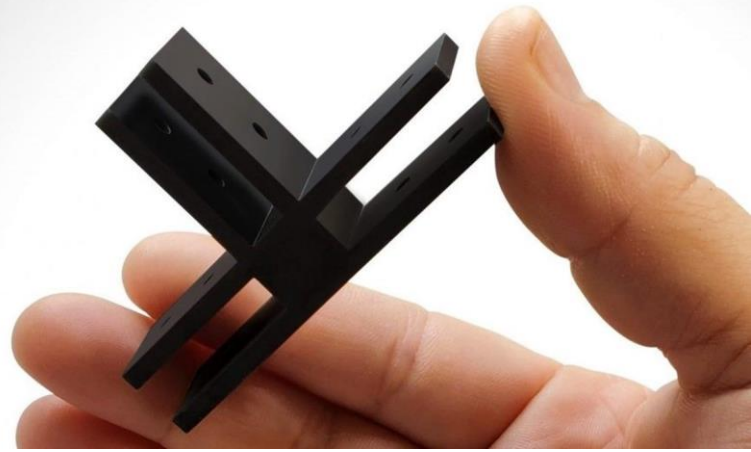
LOCTITE 3D IND406 requires a thermal curing cycle after UV post curing to achieve specified properties. It is recommended to place parts in a heated oven to cure the parts at 140°C for 2h.



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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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