LOCTITE®

IND405™

HDT50

HIGH ELONGATION

CLEAR

Certified for Carbon® Printers

5110 Port Chicago Hwy
Concord CA 94520

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Henkel

IND405™ HDT50 High Elongation Clear

Description

LOCTITE® 3D IND405™ is a high elongation and high toughness material with outstanding impact resistance and excellent surface finish. This stiff and durable high performance material is ideal for a wide variety of tools in the production floor, including manufacturing aids and final parts such as housings and consumer goods applications. The unique set of performance attributes makes it comparable to an unfilled thermoplastic like polypropylene. Parts can be machined, tapped, or polished for final finish.

Mechanical Properties	Method	Liquid	Green	Post Process UV Cube 15 min/per side	Post Process Dymax 5 min/per side
Tensile Stress at Break	ASTM D638		30 ± 3 MPa [1]	35 ± 2 MPa [2]	42 ± 4 MPa [3]
Tensile Stress at Yield	ASTM D638		18 ± 1 MPa [1]	36 ± 1 MPa [2]	43 ± 1 MPa [3]
Young's Modulus	ASTM D638		800 ± 26 MPa [1]	1300± 33 MPa [2]	1500 ± 31 MPa [3]
Elongation at Failure	ASTM D638		120 ± 14 % [1]	130 ± 16 % [2]	120 ± 8 % [3]
Impact Strength—IZOD Notched	ASTM D256			50 J/m [6]	50 J/m [6]
Impact Strength—IZOD Unnotched	ASTM D256			>1500 J/m [6]	>1500 J/m [6]
Other Properties					
HDT @ 0.455 MPa	ASTM D648			53°C [14]	53°C [13]
Shore Hardness "D" (0s,3s)	ASTM D2240			74,70 [15]	78,80 [10]
Taber Abrasion	ASTM D4060-19			90mg[4]	50mg[4]
Water Absorption	ASTM 570			1.2% [16]	0.99% [11]
Solid Density (Green)	ASTM D1475		1.126 [12]		
Solid Density (Post Processed)	ASTM D1475				1.134 [12]
Liquid Properties					
Viscosity	ASTM D7867	2300 cP [5]			
Liquid Density	ASTM D1475	1.050 [12]			

"Specimen printed on Carbon M2 at 9 mW/cm2 and 100 um slicing and washed in IPA 5min (3+2 in fresh IPA) then allowed to air dry for 1 hour before post cure. All specimen were conditioned in ambient lab conditions at 19-23C / 40-60% RH for at least 24 hours. ASTM Methods: D638 Type IV, 50mm/min, D256 Notched IZOD (Machine Notched), 6 mm x 12 mm, D648, D2240, D4060-19, Type "D" (0, 3 seconds), D570 24hr, D7867 @ 25°C (77°F) D1475, G-154(1 cycle), E308

1) TaskID Reference: FOR19711
2) TaskID Reference: FOR21737
3) TaskID Reference: FOR21738
4) TaskID Reference: FOR21750
5) TaskID Reference: FOR18397
6) TaskID Reference: FOR16321
7) TaskID Reference: FOR16266
8) TaskID Reference: FOR16274
9) TaskID Reference: FOR16274
10) TaskID Reference: FOR18476
11) TaskID Reference: FOR18206
12) TaskID Reference: FOR17633
13) TaskID Reference: FOR18829
14) TaskID Reference: FOR23425
15) TaskID Reference: FOR23432
16) TaskID Reference: FOR23426

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Clear Color Properties

Method: ASTM E308, Total Transmittance						
Part State	**L***	**a***	**b***	**C***	**h**	**dE**
Green / no post-processing [7]	92.425	-1.205	2.195	2.5	118.735	NA
Dymax 5000EC 5 minutes / side [8]	92.255	-0.52	1.265	1.37	112.28	1.17
Loctite CL36 60 min/side [9]	92.18	-0.32	0.89	0.94	109.88	1.831366

QUV exterior weathering conditions (ASTM G-154—Cycle 1): Clear color

Method: ASTM G-154—Cycle 1 & ASTM E308, Total Transmittance						
QUV Exposure Time (Hrs)	**L***	**a***	**b***	**C***	**h**	**dE**
0	90.86	-0.65	1.03	1.22	122.49	NA
240	91.06	-0.47	1.42	1.49	108.47	0.47

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	49 ± 3	42 ± 1	1412 ± 60	116 ± 12
300	41 ± 3	40 ± 1	1343 ± 103	78 ± 12
520	41 ± 2	44 ± 1	1469 ± 35	63 ± 16
800	38 ± 1	45 ± 1	1478 ± 51	46 ± 16

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Machine Settings

This resin is printed with the "Loctite IND405 Clear" dropdown on Carbon M series printers.

Post Processing

LOCTITE® 3D IND405™ 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 one of the following cleaning procedures:

1. Agitated IPA bath in 3-minute wash cycle(s).
2. A 2-minute final wash in clean IPA.

Or

1. Agitated Loctite® Cleaner C™ bath in 5-minute wash cycle(s).
2. A 2-minute final wash in clean IPA.

Note: Loctite® Cleaner C™ may be used but has not been validated by Carbon®.

Or

1. DPM in the Carbon Smart Part Washer.
2. After removal from the Smart Part Washer, dunk build platform and parts into a container of IPA 10 times, over 10 seconds total with an even cadence.

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® 3D IND405™ requires post curing to achieve specified properties. A wide array of post cure equipment can be used to cure appropriately. Specific to the data reported are two validated workflows using the below post cure units.

- APM LED UV Cube II at 15min/per side
- Dymax 5000EC with Metal Halide, bulb part number 38560, at 5min/per side

Storage

Store LOCTITE® 3D IND405™ in the unopened container in a dry location. Optimal Storage: 8°C to 21°C, Storage below 8°C or greater than 28°C can adversely affect products 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.

Shelf Life

LOCTITE® 3D IND405™ shelf life is 12months from the date of manufacture. This date can be found on the label of each bottle.

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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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