LOCTITE®

nexa3D®

xPP405-Clear

PhotoPlastic

HDT50

High Elongation

Clear

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nexa3D®

11/18/2020 **Preliminary v3.3**

xPP405-Clear HDT50 High Elongation Clear

Description

xPP405-Clear 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 printed with various DLP printers and machined, tapped, or polished for final finish.

Available Colors: Black, Clear

Mechanical Properties	Method	Green	Post Processed
Tensile Stress at Break	ASTM D638	30 ± 3 MPa [21]	39 ± 4 MPa [2]
Tensile Stress at Yield	ASTM D638	18 ± 1 MPa [21]	41 ± 1 MPa [2]
Young's Modulus	ASTM D638	793 ± 26 MPa [21]	1618 ± 23 MPa [2]
Elongation at Failure	ASTM D638	120 ± 14 % [21]	92 ± 18 % [2]
Maximum Flexural Stress	ASTM D790		69 ± 2 MPa [1]
Flexural Modulus	ASTM D790		1500 ± 76 MPa [1]
Flexural Strain at Break	ASTM D790		Does not Break [1]
Impact Strength—IZOD Notched	ASTM D256		65.27 ± 3 J/m [6]
Impact Strength—IZOD Unnotched	ASTM D256		>1500 J/m [6]
Other Properties			
HDT @ 0.455 MPa	ASTM D648		53°C [16]
Shore Hardness "D" (0s,3s)	ASTM D2240		79,76 [10]
Water Absorption	ASTM D570-98		2% [11]
Liquid Density	ASTM D1475		1.050 [12]
Solid Density (Green)	ASTM D1475		1.126 [12]
Solid Density (Post Processed)	ASTM D1475		1.134 [12]
Liquid Properties			
Viscosity @ 25°C (77°F)	ASTM D7867		2300 cP [5]

"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, 50mm/min, D790-B, 2mm/min, D256 Notched IZOD (Machine Notched), 6 mm x 12 mm, D648, D2240, Type "D" (0, 3 seconds), D1475, D7867

1) TaskID Reference: FOR16318
2) TaskID Reference: FOR21593
3) TaskID Reference: FOR5556
4) TaskID Reference: FOR9594
5) TaskID Reference: FOR16316
6) TaskID Reference: FOR24538
7) TaskID Reference: FOR10162
8) TaskID Reference: FOR16266
9) TaskID Reference: FOR16274
10) TaskID Reference: FOR18476
11) TaskID Reference: FOR16322
12) TaskID Reference: FOR17633
13) TaskID Reference: FOR18202
14) TaskID Reference: FOR18207
15) TaskID Reference: FOR18206
16) TaskID Reference: FOR18829
17) TaskID Reference: FOR18201
18) TaskID Reference: FOR18611
19) TaskID Reference: FOR18208
20) TaskID Reference: FOR18531
21) TaskID Reference: FOR19711
22) TaskID Reference: FOR20002

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Clear Color Properties

Method: ASTM E308, Total Transmission

Part State	L*	a*	b*	C*	h	dE
Green / no post-processing [8]	92.425	-1.205	2.195	2.5	118.735	NA
Dymax 5000EC 10 minutes / side [9]	92.255	-0.52	1.265	1.37	112.28	1.17
Loctite CL36 60 min/side [22]	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 Transmission

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 **FOR16324 5mm/min**

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

Method: ASTM G-154—Cycle 1 **FOR19972 5mm/min current**

QUV Exposure Time (Hrs)	Tensile Stress at break (MPa)	Yield Stress (MPa)	Young's Modulus (MPa)	Elongation at break (%)
0	40±2	34±1	1260±34	118±12
325	35±2	36±1	1469±11	80±14
650	34±1	39±1	1510±32	68±7
975	30±2	37±1	1500±10	50±9

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Post Processing

xPP405-Clear 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. Nexa3D 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.nexa3d.com.

Post Curing

xPP405-Clear requires post curing to achieve specified properties. A wide array of post cure equipment can be used to cure xPP405-Clear appropriately. A list of validated devices with detailed information can be found by contacting us at www.nexa3d.com.

Post Processing Options

Color/Dying - Laboratory testing shows that dying xPP405-Clear using solvent solutions is possible. In order to maintain mechanical properties we recommend dying after post cure is completed. Dyeing prior to post cure, results may vary and effect mechanical properties.

Polishing / Coating is needed for optimum clarity to be obtained. For more information please contact your Henkel representative.

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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. Nexa3D 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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