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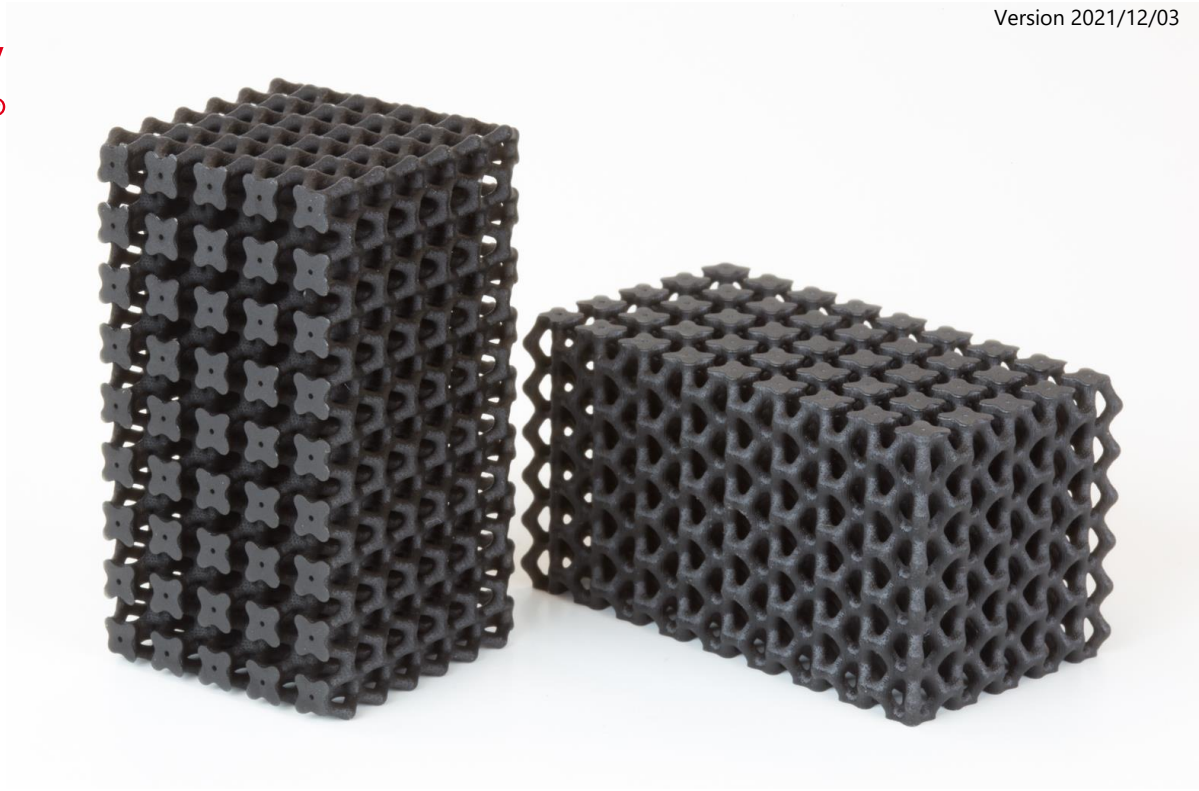

LOCTITE 3D PRO410™

High Accuracy Photoplastic Black

LOCTITE®
Henkel Corporation
loctite3dp@henkel.com

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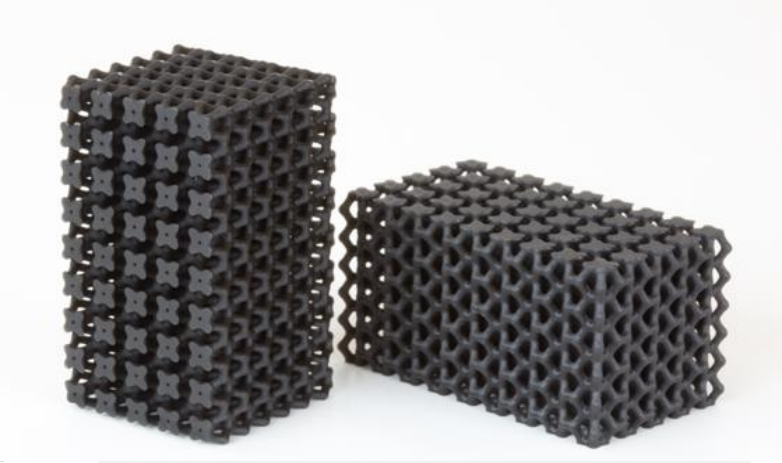
LOCTITE®

PRO410™

HIGH ACCURACY
PHOTOPLASTIC
BLACK



LOCTITE 3D PRO410™

LOCTITE 3D PRO410 is a fast printing, rigid photopolymer that can be printed with very high-resolution.

LOCTITE 3D PRO410 has been formulated to provide high print accuracy and an exceptional surface finish. This material prints three times faster than traditional Henkel 3DP printing resins.

This product is ideal for printing accurate prototypes, that will be exposed to temperatures up to 60°C. This product can be printed on DLP and LCD machines.

Benefits:

- Excellent surface finish
- 3X faster printing*
- Accurate prototypes

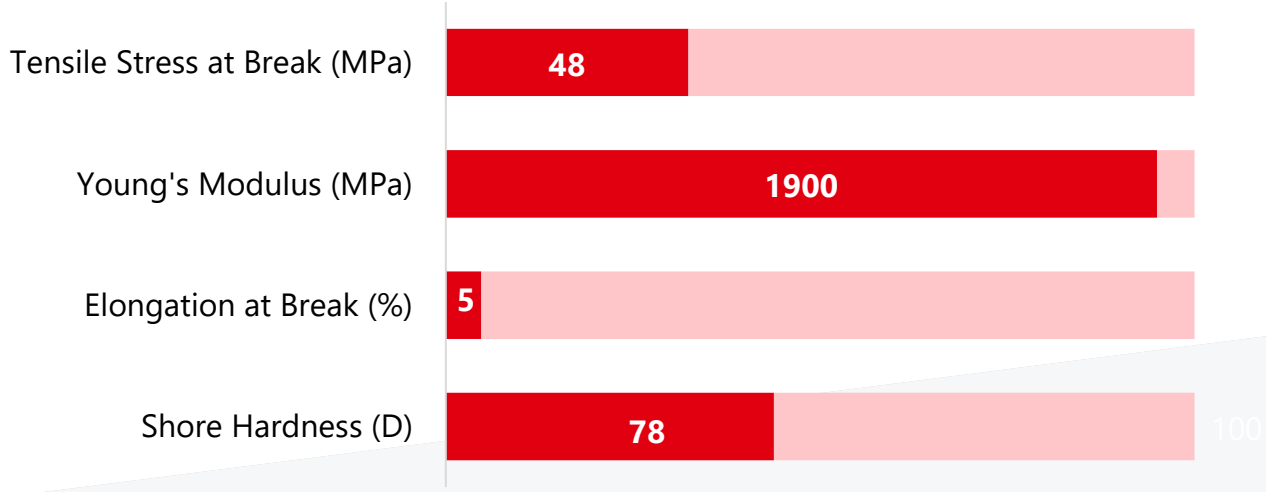
Ideal for:

- Printer setup and calibration
- Rapid prototypes

Markets:

Industry | Automotive | Consumer Goods

*vs other Henkel 3D printing resins



*Values shown are linked to parts printed on a DLP printer at 385nm & post cured with broad spectra bulb (Loctite UVALOC 1000)

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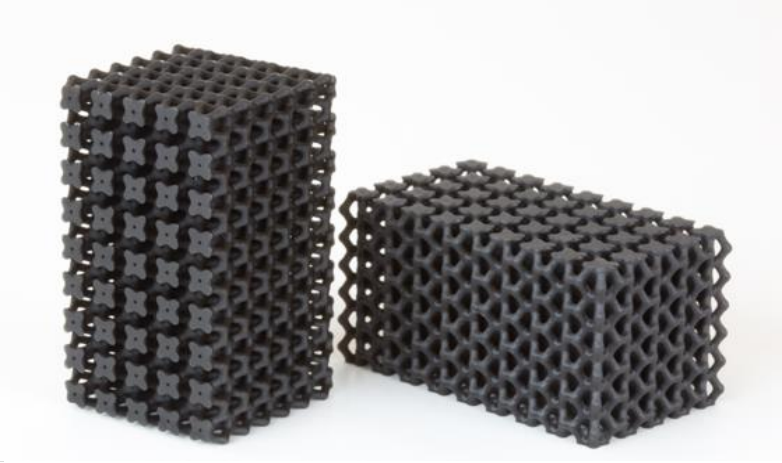

MECHANICAL PROPERTIES

Mechanical Properties	Measure	Method	Green	LED 405nm (CL36)	Broad Spectrum (Bulb)
Tensile Stress at Break	MPa	ASTM D638[1]	21 ± 1 [3]	43 ± 1 [6]	48 ± 1 [10]
Young's Modulus	MPa	ASTM D638[2]	794 ± 80 [3]	1665 ± 22 [6]	1937 ± 43 [10]
Elongation at Break	%	ASTM D638	9 ± 3 [3]	5 ± 1 [6]	5 ± 1 [10]
Flexural Stress at Break	MPa	ASTM D790	n/a [4,5]	n/a [4,7]	n/a [4,11]
Flexural Modulus	MPa	ASTM D790	859 ± 70 [5]	2198 ± 31 [7]	2499 ± 16 [11]
Flexural Strain at Break	%	ASTM D790	>5 [4,5]	>5 [4,7]	>5 [4,11]
Flexural Stress at Yield	MPa	ASTM D790	33 ± 3 [5]	73 ± 1 [7]	84 ± 2 [11]
Other Properties					
HDT at 0.455 MPa	°C	ASTM D648	n/a	62 ± 2 [8]	71 ± 4 [12]
HDT at 1.82 MPa	°C	ASTM D648	n/a	50 ± 1 [9]	53 ± 2 [13]
Tg (DMA, tanδ peak)	°C	ASTM E1640	n/a	-	82 [23]
IZOD Impact Strength (Notched)	J/m	ASTM D256	n/a	25 ± 3 [14]	24 ± 4 [15]
Water Absorption (24hr)	%	ASTM D570	n/a	-	0.3 [16]
Water Absorption (72hr)	%	ASTM D570	n/a	-	-
Shore Hardness (0s, 3s)	D	ASTM D2240	73 ± 1 [17]	78 ± 1 [18]	78± 1 [19]
Solid Density	g/cm^3	ASTM D792	n/a	1.4 [20]	-
Biocompatibility					
Irritation		ISO 109935-23*			Comply[22]

Liquid Properties	Measure	Method	Value
Viscosity at 25°C (77°F)	cP	ASTM D7867	400 – 600 [21]
Liquid Density	g/cm^3	ASTM D792	1.1

"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.D256 Notched IZOD (Machine Notched), D648; D2240, Type "D" (0, 3 seconds);), D7867@ 25°C (77°F).

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

Internal Data Sources:

[3]FOR30220, [4]parts did not break below 5%, [5]FOR30222, [6]FOR30138, [7] FOR30223, [8]FOR30225, [9]FOR30226, [10] FOR30221, [11]FOR30224, [12] FOR30227, [13]FOR30228, [14]FOR30229, [15]FOR30230, [16]FOR22670, [17]FOR22615, [18]FOR22617, [19]FOR25631, [20]FOR28023, [21]FOR17012, [22]FOR52816(in vitro), [23]FOR63337

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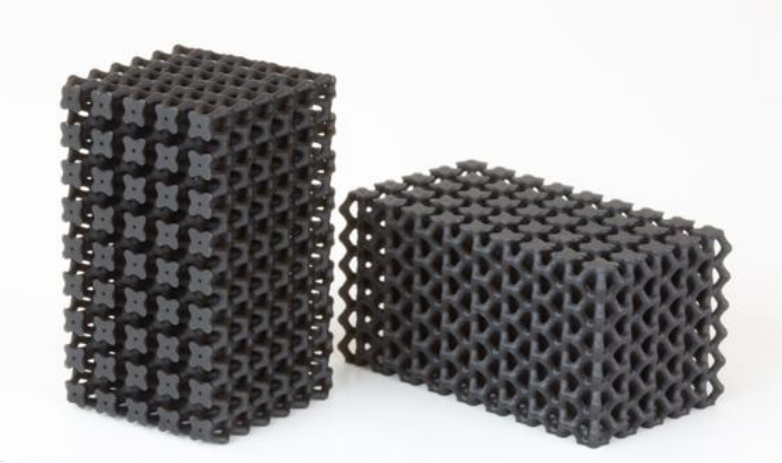

WORKFLOW

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 PRO410 product is formulated to print optimally on any DLP machine. 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 25°C
- Intensity: 4 mW/cm² to 8 mW/cm²

Exposure time for an intensity of 5 mW/cm²

Layer Thickness (µm):	100
First layer time (s)	25
Burn in region (s):	15
Model Layer Cure Time (s):	3

Ec (mJ/cm²)	2.79
Dp (mm):	0.06

POST PROCESSING

LOCTITE 3D PRO410 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	Intervals	Additional Info
Cleaning	IPA	Ultra sonic bath	2 min	1 or 2	Allow parts to dry between intervals
Dry	n.a.	Compressed air	10 to 60 s	2	Air pressure (50psi)
Wait	n.a.	Ambient condiction	60 min	1	Room temperature

POST CURING

LOCTITE 3D PRO410 requires post curing to achieve specified properties. It is recommended that either an LED or wide spectrum lamp be used to post cure parts.

UC Curing Unit	UV Source	Intensity	Cure time/ side	Additional Settings (Shelf, Output Energy)
Loctite CL36	405nm LED	80 mW/cm² at 405 nm	10 min	100% top & side
Loctite UVALOC 1000	Mercury Arc Bulb (broad spectrum)	30 mW/cm² at 365 nm	5 min	500 W, lowest shelf
Dymax 5000 EC Flood	Mercury Arc Bulb (broad spectrum)	150 mW/cm² at 380 nm	2 min	Shelf K

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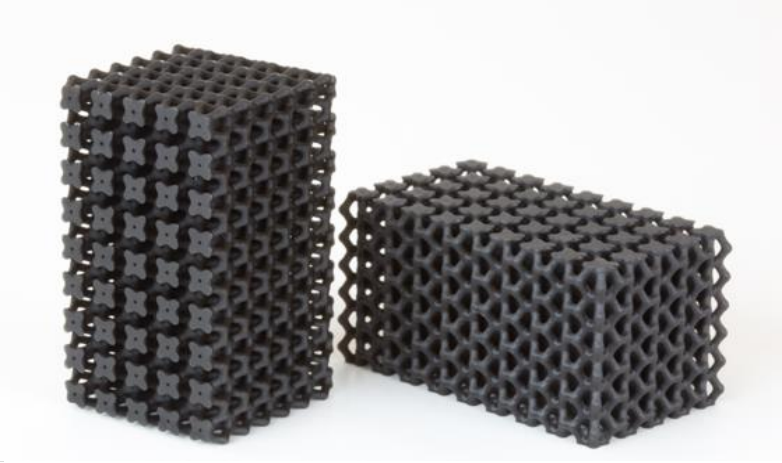

NOTE

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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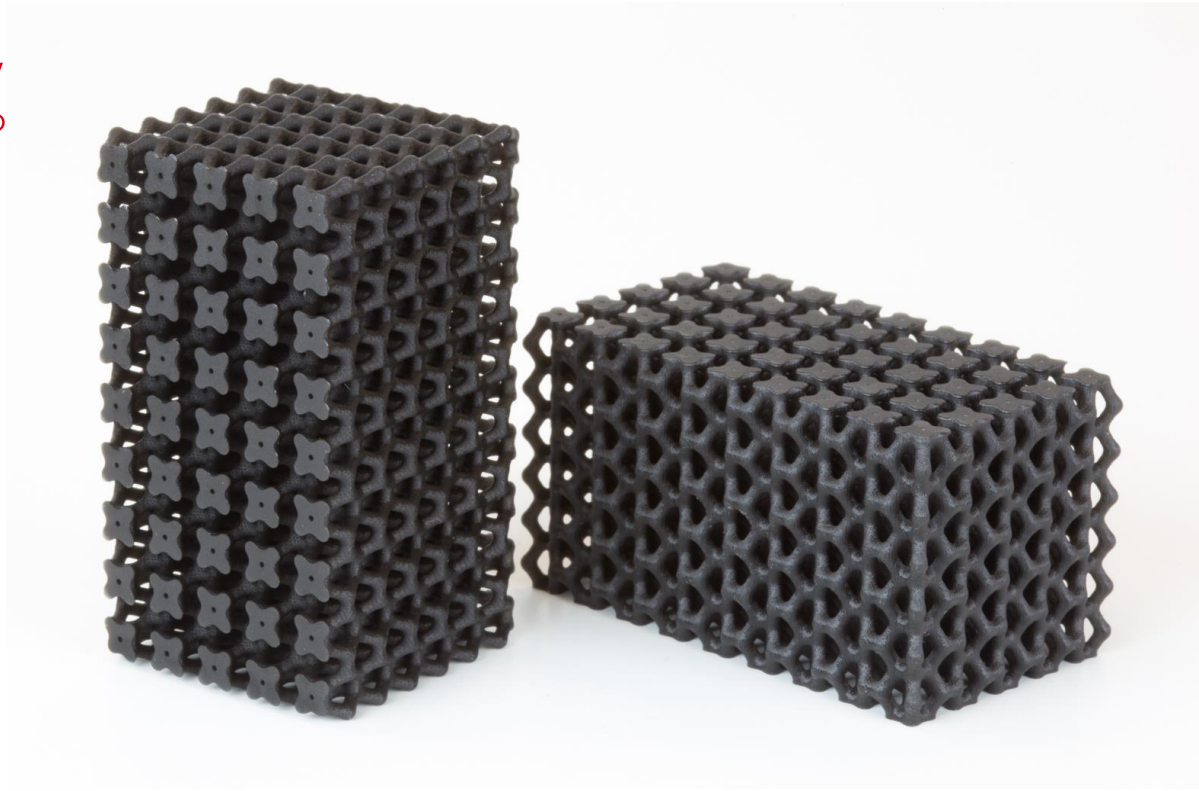

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