

LOCTITE®

MED412

Loctite 3D
Medical High Impact

LOCTITE®

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Preliminary version 1.1



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MED412 Medical High Impact

Description

LOCTITE® Medical Grade products are high performance fluids developed to be highly consistent with extraordinary attributes. LOCTITE® MED412 is a very strong and durable photopolymer with mechanical attributes similar to polypropylene. LOCTITE® MED412 displays fantastic elongation, impact strength, and compression strength. Parts manufactured with LOCTITE® MED412 can be machined, tapped, or polished. This product should only be printed on a DLP machine.

LOCTITE® MED412 has been tested in QUV exterior weathering conditions (ASTM G-154) for 800 hours with less than a 15% change in Tensile and IZOD Impact properties. [1]

Available Colors: White and Ultra Clear

Mechanical Properties	Method	Green	White Dymax 5000 10 min /side	(Ultra) Clear Dymax 5000 10 min /side
Tensile Strength at Break	ASTM D638	20.3 ± 1.3 MPa [12]	35.8 ± 6.6 MPa [7]	38 ± 1.4 MPa [1]
Tensile Stress at Yield	ASTM D638	18.5 ± 2.5 MPa [12]	35.96 ± 4.23 MPa [7]	29.36 ± 1.3 MPa [1]
Young's Modulus	ASTM D638	797 ± 106 MPa [12]	1394 ± 165 MPa [7]	1245 ± 43 MPa [1]
Elongation at Failure	ASTM D638	149 ± 6.5 % [12]	115 ± 21% [7]	141 ± 4% [1]
Flexural Stress at Yield	ASTM D790		53.81 ± 1.72 MPa [8]	37.6 ± 2.56 MPa [2]
Flexural Modulus	ASTM D790		1427.5 ± 83.3 MPa [8]	1022 ± 76 MPa [2]
Flexural Strain at Break	ASTM D790		>10% [8]	>10% [2]
Other Properties				
IZOD Impact Strength (Notched)	ASTM D256		45.7 ± 5.07 J/m [9]	42.6 ± 5 J/m [3]
HDT @ 0.455 MPa (VICAT)	ASTM D648		TBD	TBD
Shore Hardness	Scale D			44D [4]
Water Absorption (24 hr)	ASTM D570		0.23% [11]	0.36% [5]
Ec	Internal		[13]	[14]
Dp	Internal		[13]	[14]

Liquid Properties

Viscosity @ 25°C (77°F)	701.54 ± 150 cP [10]	637 ± 150 cP [6]
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1.TaskID Reference: FOR17060
2.TaskID Reference: FOR17061
3.TaskID Reference: FOR17059
4.TaskID Reference: FOR17056
5.TaskID Reference: FOR17058

6.TaskID Reference: FOR17057
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8.TaskID Reference: FOR17471
9.TaskID Reference: FOR17473
10.TaskID Reference: FOR17479

11.TaskID Reference: FOR17478
12.TaskID Reference: FOR17689

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Machine Settings

LOCTITE® MED412 is formulated to print optimally on any DLP machine. It is recommended to print with 405 nm wavelength projectors with irradiance between 3-7 mW/cm². Layer time is given below at 6 mW/cm²:

Layer Thickness: 25 µm 50 µm 100 µm			
Base Cure Time:	45 s	45 s	45 s
Model Layer Cure Time:	2 s	3.5 s	6 s

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

Post Processing

LOCTITE® MED412 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 friendly cleaner. LOCTITE® recommends either IPA or Glycol Ether TPM. A 5 minute wash in an ultrasonic bath using the recommended cleaners and using compressed air to remove residual solvent from the surface of the material is recommended.

Post Curing

LOCTITE® MED412 requires post curing to achieve specified properties. A wide array of post cure boxes can be used for appropriate times. Three examples are as follows:

- 1) Dymax 5000-EC for 10 minutes per side.
- 2) NextDent LC-3D Box for 90 minutes per side.
- 3) OttoFlash for 2,000—4,000 flashes per side

Liquid Handling Requirements

Please see Loctite SDS for all PPE requirements