

# Nylon 12 Tough

A highly ductile and dimensionally accurate nylon powder.

Nylon 12 Tough Powder offers the best-in-class refresh rate among Nylon powders, high ductility, and great dimensional accuracy across the build chamber. Print more durable parts for prototyping and small batch production that have reduced warpage without sacrificing strength.

For best results, Nylon 12 Tough Powder is required to undergo a powder aging process prior to first build. Nylon 12 Tough Powder is specifically developed for use on the Fuse 1+ 30W printer.



Material properties testing was completed with parts printed using aged powder on a bed temperature tuned printer. Scan the QR Codes to learn more about Powder Aging and Bed Temperature Tuning.

Powder  
Aging



Temperature  
Tuning



FLP12T01

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To the best of our knowledge the information contained herein is accurate. However, Formlabs, Inc. makes no warranty, expressed or implied, regarding the accuracy of these results to be obtained from the use thereof.

Mechanical Properties	METRIC	IMPERIAL	METHOD
Ultimate Tensile Strength	42 MPa	6200 psi	ASTM D 638-14 Type 1
Tensile Modulus	1450 MPa	215 ksi	ASTM D 638-14 Type 1
Elongation at Break (X/Y)	25%	25%	ASTM D 638-14 Type 1
Elongation at Break (Z)	15%	15%	ASTM D 638-14 Type 1
Flexural Properties	METRIC	IMPERIAL	METHOD
Flexural Strength	42 MPa	6200 psi	ASTM D 790-17
Flexural Modulus	1100 MPa	165 ksi	ASTM D 790-17
Other Properties	METRIC	IMPERIAL	METHOD
Notched Izod	60 J/m	1.1 ft-lb/in	ASTM D256-10
Thermal Properties	METRIC	IMPERIAL	METHOD
Heat Deflection Temp. @ 1.8 MPa	46 °C	116 °F	ASTM D 648-16
Heat Deflection Temp. @ 0.45 MPa	161 °C	321 °F	ASTM D 648-16
Vicat Softening Temperature	170 °C	337 °F	ASTM D 1525
Other Properties	METRIC	IMPERIAL	METHOD
Water Absorption (printed part)	0.30%	0.30%	ASTM D570

#### Biocompatibility Testing In Progress

Samples are currently undergoing testing for biocompatibility. When the testing has concluded, results will be updated on this sheet. In the meantime, Formlabs recommends that customers complete their own biocompatibility evaluation specific to their intended end use.

#### Solvent Compatibility

Percent weight gain over 24 hours for a printed 1 x 1 x 1 cm cube immersed in respective solvent:

Solvent	24 hr weight gain (%)	Imperial	24 hr weight gain (%)
Acetic Acid 5%	0.2	Mineral oil, heavy	1.0
Acetone	0.2	Mineral oil, light	0.8
Bleach ~5% NaOCl	0.1	Salt Water (3.5% NaCl)	0.2
Butyl Acetate	0.1	Skydrol 5	0.8
Diesel Fuel	0.6	Sodium hydroxide solution (0.025% pH = 10)	0.1
Diethyl glycol monomethyl ether	0.5	Strong Acid (HCl Conc)	5.6
Hydraulic Oil	0.9	TPM	0.8
Hydrogen peroxide (3%)	0.1	Water	0.1
Isooctane	0.1	Xylene	0.2
Isopropyl Alcohol	0.3		

<sup>1</sup> Material properties may vary with part geometry, print orientation and temperature.

<sup>2</sup> Parts were printed using Fuse 1+ with Nylon 12 Tough powder. Parts were conditioned at 23 °C, 50% R.H. for 40 hours.

<sup>3</sup> Material properties may vary based on part design and manufacturing practices. It is the manufacturer's responsibility to validate the suitability of the printed parts for the intended use.

<sup>4</sup> Nylon 12 Tough was tested at NAMSA World Headquarters, OH, USA.