

ENGINEERING MATERIAL

Nylon 12

Nylon 12 Powder For Strong, Functional Prototypes and End-Use Parts

With high tensile strength, ductility, and environmental stability, Nylon 12 Powder is suitable for creating complex assemblies and durable parts with minimal water absorption.

Nylon 12 Powder is specifically developed for use on the Fuse 1.



V1 FLP12G01

formlabs 

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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.

NYLON 12 MATERIAL PROPERTIES DATA

	METRIC ^{1,2}	IMPERIAL ^{1,2}	METHOD
Tensile Properties			
Ultimate Tensile Strength	50 MPa	7252 psi	ASTM D638 Type 1
Tensile Modulus	1850 MPa	268 ksi	ASTM D638 Type 1
Elongation at Break (X/Y)	11%	11%	ASTM D638 Type 1
Elongation at Break (Z)	6%	6%	ASTM D638 Type 1
Flexural Properties			
Flexural Strength	66 MPa	9572 psi	ASTM D790 A
Flexural Modulus	1600 MPa	232 ksi	ASTM D790 A
Impact Properties			
Notched Izod	32 J/m	0.60 ft-lb/in	ASTM D256
Temperature Properties			
Heat Deflection Temp. @ 1.8 MPa	87 °C	189 °F	ASTM D648
Heat Deflection Temp. @ 0.45 MPa	171 °C	340 °F	ASTM D648
Vicat Softening Temperature	175 °C	347 °F	ASTM D1525
Other Properties			
Moisture Content (powder)	0.25%	0.25%	ISO 15512 Method D
Water Absorption (printed part)	0.66%	0.66%	ASTM D570

Samples printed with Nylon 12 Powder have been evaluated in accordance with ISO 10993-1:2018, and has passed the requirements for the following biocompatibility risks:

ISO Standard	Result ^{3,4}
EN ISO 10993-5:2009	Not cytotoxic
ISO 10993-10:2010/(R)2014	Non irritant
ISO 10993-10:2010/(R)2014	Not a sensitizer

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 (%)	Solvent	24 hr weight gain (%)
Acetic Acid 5%	0.10	Mineral oil, heavy	0.66
Acetone	0.14	Mineral oil, light	0.54
Bleach ~5% NaOCl	0.21	Salt Water (3.5% NaCl)	0.15
Butyl Acetate	0.18	Skydrol 5	0.59
Diesel Fuel	0.43	Sodium hydroxide solution (0.025% pH = 10)	0.20
Diethyl glycol monomethyl ether	0.49	Strong Acid (HCl Conc)	0.76
Hydraulic Oil	0.59	TPM	0.31
Hydrogen peroxide (3%)	0.20	Water	0.05
Isooctane	0.01	Xylene	0.12
Isopropyl Alcohol	0.19		

¹ Material properties may vary with part geometry, print orientation and temperature.

² Parts were printed using Fuse 1 with Nylon 12 Powder. Parts were conditioned at 50% relative humidity and 23 °C for 7 days before testing.

³ 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.

⁴ Nylon 12 was tested at NAMS World Headquarters, OH, USA.