

SLS

Selective Laser Sintering

SLS Material Printability Chart

	Nylon 12 Recommended	Nylon 11	Nylon 12 GF	Nylon 11 CF	TPU 90A	Nylon 12 White Nitrogen**	Nylon 12 Tough Air
Air / Inert Recommendation	Air	Nitrogen**	Air	Nitrogen	Air		
Refresh Rate	30%	30%	50%	30%	20%	30%	20%
Printer Compatibility	Fuse 1, Fuse 1+	Fuse 1+	Fuse 1, Fuse 1+	Fuse 1+	Fuse 1, Fuse 1+	Fuse 1+	Fuse 1+
Dimensional Accuracy	Best	Good	Best	Good	Fair	Good	Best
Surface Finish	Best	Good	Best	Good	Fair	Good	Good
Print Speed	Best	Fair	Fair	Fair	Good	Fair	Good
Fine Feature Resolution	Best	Fair	Fair	Fair	Good	Good	Best
High Aspect Ratio Parts	Best	Fair	Good	Good	Fair	Best	Best
Large Cross Section Parts	Good	Fair	Good	Good	Fair	Good	Best
Material Properties							
Tensile Strength Impact Resistance	Best	Best	Good	Best	Not Recommended	Best	Good
	Good	Best	Good	Best	—	Good	Best
Elongation	Fair	Good	Not Recommended	Fair	Best	Fair	Good
Temp Resistance	Fair	Not Recommended	Good	Best	Not Recommended	Fair	Not Recommended
Low Moisture Absorption	Fair	Best	Good	—	Fair	Not Recommended	Good
Lightweight / Density	Good	Good	Fair	Good	Good	Good	Good
See It In Use	 Kling & Freitag	 MAG Orthotics	 JasperEngines	 TUM	 Artus3D	Coming Soon	Coming Soon

**Nylon 11 is recommended to print in Nitrogen environment. Printing in air is possible but will compromise material properties and lead to powder degradation at a faster rate.

**Nylon 12 White Powder is recommended to print in Nitrogen to maintain the most consistent white appearance. Printing in air has been correlated with yellowing of powder over time.

Powder yellowing has little to no impact on the ability and efficacy of dyeing printed parts.

Nylon 12 Powder

SLS 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 Series printers.



V1 FLP12G01

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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	50 MPa	7252 psi	ASTM D638 Type 1
Tensile Modulus	1850 MPa	268 ksi	ASTM D638 Type 1
Elongation at Break (X/Y) Elongation at Break (Z)	11% 6%	11% 6%	ASTM D638 Type 1 ASTM D638 Type 1
Flexural Properties	METRIC	IMPERIAL	METHOD
Flexural Strength	66 MPa	9572 psi	ASTM D 790-15
Flexural Modulus	1600 MPa	232 ksi	ASTM D 790-15
Impact Properties	METRIC	IMPERIAL	METHOD
Notched Izod	32 J/m	0.60 ft-lb/in	ASTM D256-10
Thermal Properties	METRIC	METHOD	
Heat Deflection Temp. @ 1.8 MPa Heat Deflection Temp. @ 0.45 MPa Vicat Softening Temperature	171 °C 175 °C	189 °F 340 °F	ASTM D648 ASTM D648 ASTM D1525
Other Properties		IMPERIAL	METHOD
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	Description ^{3,4}
ISO 10993-5:2009	Not cytotoxic
ISO 10993-10:2010/(R)2014	Not an irritant
ISO 10993-10:2010/(R)2014	Not a sensitizer
ISO 10993-11:2017 (Material Mediated Pyrogenicity)	Non-Pyrogenic
ISO 10993-11:2017 (Acute Systemic Toxicity)	No Evidence of Systemic Toxicity

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%	0.1	Mineral oil (Heavy)	0.7
Acetone	0.1	Mineral oil (Light)	0.5
Bleach ~5% NaOCl	0.2	Salt Water (3.5% NaCl) Skydrol 5	0.2
Butyl Acetate	0.2	Sodium Hydroxide solution (0.025% PH 10)	0.6
Diesel Fuel	0.4	Strong Acid (HCl conc)	0.2
Diethyl glycol Monomethyl Ether	0.5	Tripropylene glycol	0.8
Hydraulic Oil	0.6	monomethyl ether	0.3
Hydrogen peroxide (3%)	0.2	Water	0.1
Isooctane (aka gasoline)	<0.1	Xylene	0.1
Isopropyl Alcohol	0.2		

Flammability Properties

Testing Standard	Rating
UL 94 Section 7	HB *

* Thickness of the sample tested = 3.00mm

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.

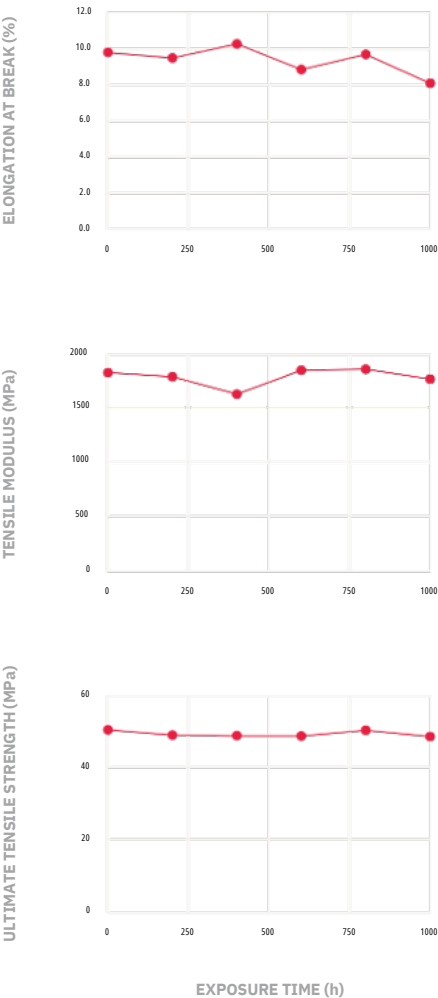
³ Material properties may vary based on part design and manufacturing practices. It is the manufacturer's responsibility to validate the suitability of the printed parts for the intended use.

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

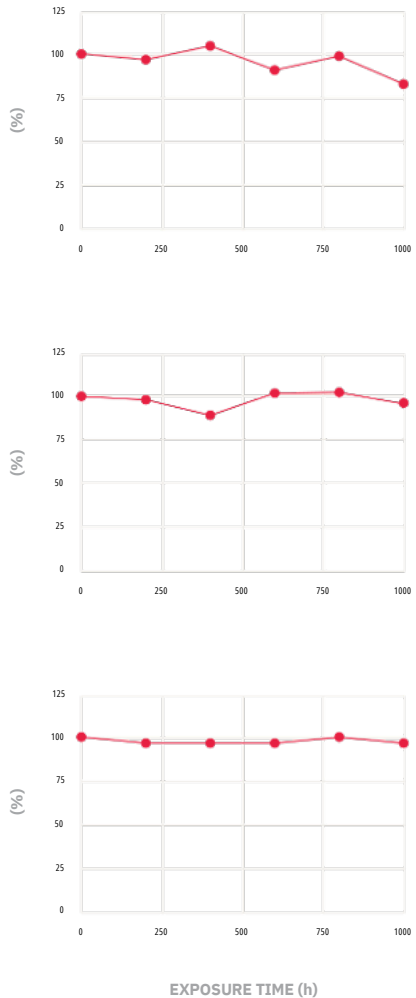
Outdoor Aging ASTM D4329

Nylon 12 samples were aged by Applied Technical Services (ATS), a certified independent laboratory, using ASTM D4329-21, Cycle A. This standard outlines procedures for accelerated weathering of plastics using a Xenon arc light source, which simulates the full spectrum of sunlight (UV, visible, and infrared) and includes moisture cycles via water spray. The aged samples were then tested at Formlabs by a calibrated automatic tensile tester, as well as measured and analyzed with a spectrophotometer for color changes. Read more about the results in the [whitepaper](#).

Test Result



% Of Initial Value



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 built. 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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Mechanical Properties	METRIC	IMPERIAL	METHOD
Ultimate Tensile Strength	42 MPa	6200 psi	ASTM D638-14 Type 1
Tensile Modulus Elongation	1450 MPa	215 ksi	ASTM D638-14 Type 1
at Break (X/Y) Elongation at	25%	25%	ASTM D638-14 Type 1
Break (Z) Flexural Strength	15%	15%	ASTM D638-14 Type 1
Flexural Modulus Notched	42 MPa	6200 psi	ASTM D790-17
Izod	1100 MPa	165 ksi	ASTM D790-17
	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 D648-16
Heat Deflection Temp. @ 0.45 MPa	161 °C	321 °F	ASTM D648-16
Vicat Softening Temperature	170 °C	337 °F	ASTM D1525
Other Properties	METRIC	IMPERIAL	METHOD
Water Absorption (printed part)	0.30%	0.30%	ASTM D570

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

ISO Standard	Description ^{3,4}
ISO 10993-11:2017	No systemic toxicity
ISO 10993-5:2009	Not cytotoxic
ISO 10993-23:2021	Not an irritant
ISO 10993-10:2021	Not a sensitizer
ISO 10993-11:2017	Nonpyrogenic

Flammability Properties

Testing Standard	Rating
UL 94 Section 7	HB *

* Thickness of the sample tested = 3.00mm

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%	0.2	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	0.1
Diethyl glycol monomethyl ether	0.5	(0.025% pH = 10)	5.6
Hydraulic Oil	0.9	Strong Acid (HCl Conc)	0.8
Hydrogen peroxide (3%)	0.1	TPM	0.1
Isooctane	0.1	Water	0.2
Isopropyl Alcohol	0.3	Xylene	

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

² Parts were printed using Fuse 1+ 30W with Nylon 12 Tough Powder. Parts were conditioned at 23 °C, 50% R.H. for 40 hours.

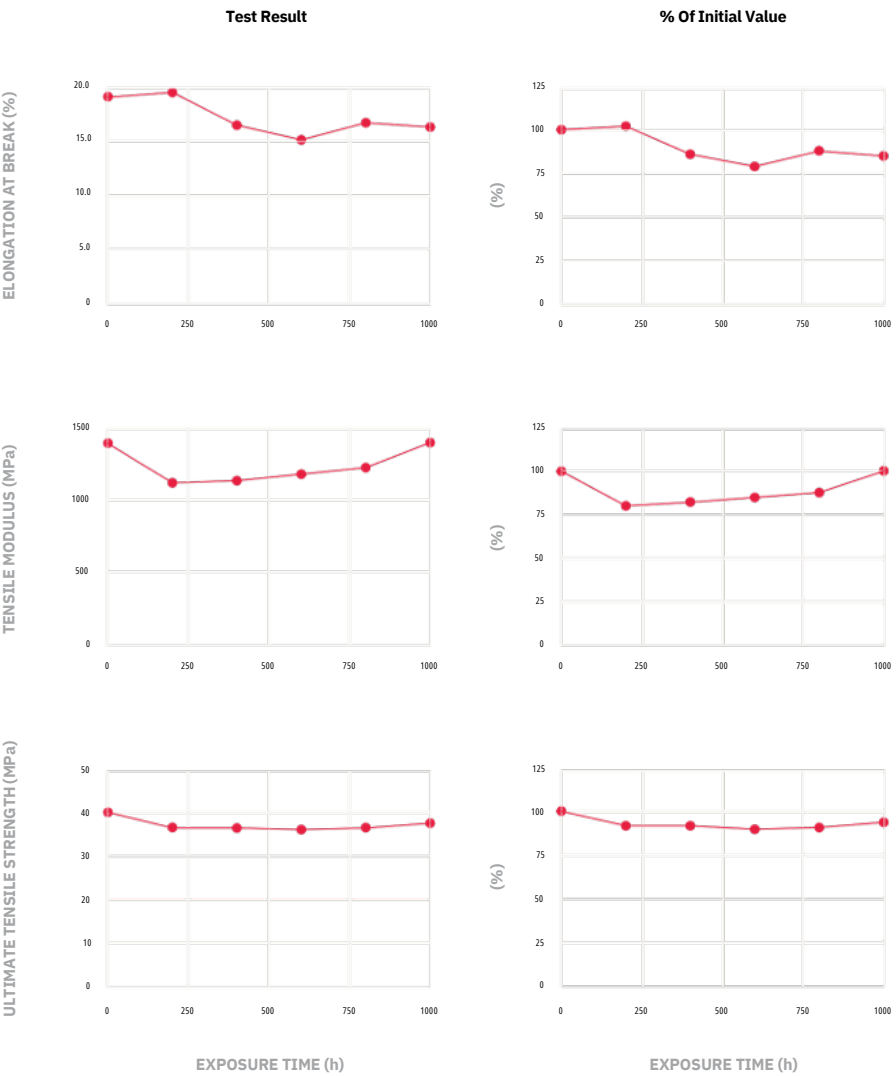
³ Material properties may vary based on part design and manufacturing practices. It is the manufacturer's responsibility to validate the suitability of the printed parts for the intended use.

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

Outdoor Aging ASTM D4329

Nylon 12 Tough samples were aged by Applied Technical Services (ATS), a certified independent laboratory, using ASTM D4329-21, Cycle A. This standard outlines procedures for accelerated weathering of plastics using a Xenon arc light source, which simulates the full spectrum of sunlight (UV, visible, and infrared) and includes moisture cycles via water spray. The aged samples were then tested at Formlabs by a calibrated automatic tensile tester, as well as measured and analyzed with a spectrophotometer for color changes.

Read more about the results in the [whitepaper](#).



Nylon 12 White

Nylon 12 White Powder combines all of the great qualities of the general purpose and biocompatible Nylon 12 Powder with the customizability of white parts. Create functional prototypes and end-use customer-facing parts that can be easily dyed to match brand aesthetics as well as medical devices and models with high contrast and detail.

For best results, print Nylon 12 White Powder with inert atmospheric control on a bed temperature tuned printer. Nylon 12 White Powder is specifically developed for use on the Fuse 1+ 30W printer.



Material properties testing was completed with parts printed on a bed temperature tuned printer. Scan the QR Code to learn more about the Bed Temperature Tuning process.

Temperature
Tuning



V1 **FLP12W01**

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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		47 MPa	6900 psi	ASTM D638-14 Type 1
Tensile Modulus	Elongation at Break (X/Y)	1950 MPa	285 ksi	ASTM D638-14 Type 1
		8%	8%	ASTM D638-14 Type 1
Break (Z) Flexural Strength		6%	6%	ASTM D638-14 Type 1
Flexural Modulus	Notched Izod	56 MPa	8100 psi	ASTM D790-17
		1500 MPa	217 ksi	ASTM D790-17
		28 J/m	0.5 ft-lb/in	ASTM D256-10
Thermal Properties		METRIC	IMPERIAL	METHOD
Heat Deflection Temp. @ 1.8 MPa		87 °C	189 °F	ASTM D648-16
Heat Deflection Temp. @ 0.45 MPa		177 °C	350 °F	ASTM D648-16
Vicat Softening Temperature		177 °C	350 °F	ASTM D1525
Other Properties		METRIC	IMPERIAL	METHOD
Water Absorption (printed part)		1.40%	1.40%	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. Samples printed with Nylon 12 White have been evaluated in accordance with ISO 10993-1:2018, and has passed the requirements for the following biocompatibility risks:

ISO Standard Description	Result ^{3,4}
ISO 10993-11:2017	No systemic toxicity
ISO 10993-5:2009	Not cytotoxic
ISO 10993-23:2021	Not an irritant
ISO 10993-10:2021	Not a sensitizer
ISO 10993-11:2017	Nonpyrogenic

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%	0.2	Mineral oil, heavy	2.2
Acetone	0.2	Mineral oil, light	2.0
Bleach ~5% NaOCl	0.2	Salt Water (3.5% NaCl)	0.1
Butyl Acetate	0.2	Skydrol 5	1.9
Diesel Fuel	1.3	Sodium hydroxide solution (0.025% pH = 10)	0.1
Diethyl glycol monomethyl ether	1.0		4.8
Hydraulic Oil	1.7	Strong Acid (HCl Conc)	1.1
Hydrogen peroxide (3%)	0.1	TPM	0.1
Isooctane	0.3	Water	0.2
Isopropyl Alcohol	0.2	Xylene	

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

² Parts were printed using Fuse 1+ 30W with Nylon 12 White Powder. Parts were conditioned at 23 °C, 50% R.H. for 40 hours.

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 White was tested at NAMS World Headquarters, OH, USA.

Nylon 12 GF Powder

A high-performance SLS material for in-house production of parts that require high rigidity, dimensional accuracy, and thermal stability.

Specifically developed for use on the Fuse Series Printers.

Fixtures Undergoing Long-Term Sustained Loading

Stiff Structural Components

End-Use Industrial Parts

Functional Prototypes for composite products

Thermally Stressed Housings



FLP12B01

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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.

Material Properties	METRIC ^{1,2}	IMPERIAL ^{1,2}	METHOD
Mechanical Properties	METRIC ^{1,2}	IMPERIAL ^{1,2}	METHOD
Ultimate Tensile Strength	38 MPa	5510 psi	ASTM D638-14 Type 1
Tensile Modulus	2800 MPa	406 ksi	ASTM D638-14 Type 1
Elongation at Break (X/Y) Elongation at Break (Z)		4%	ASTM D638-14 Type 1
		3%	ASTM D638-14 Type 1
Flexural Properties	METRIC ^{1,2}	IMPERIAL ^{1,2}	METHOD
Flexural Strength	56 MPa	8122 psi	ASTM D790-15
Flexural Modulus	2400 MPa	348 ksi	ASTM D790-15
Impact Properties	METRIC ^{1,2}	IMPERIAL ^{1,2}	METHOD
Notched Izod	36 J/m	0.67 ft-lb/in	ASTM D256-10
Thermal Properties	METRIC ^{1,2}	IMPERIAL ^{1,2}	METHOD
Heat Deflection Temp. @ 1.8 MPa Heat			ASTM D648-16
Deflection Temp. @ 0.45 MPa Vicat	113 °C	235 °F	ASTM D648-16
Softening Temperature	170 °C	338 °F	ASTM D1525
Other Properties			METHOD
Moisture Content (powder)	METRIC ^{1,2}	IMPERIAL ^{1,2}	ISO 15512 Method D
Water Absorption (printed part)		0.23%	ASTM D570
		0.24%	

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

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

Flammability Properties

Testing Standard	Rating
UL 94 Section 7	HB *

* Thickness of the sample tested = 3.00mm

SOLVENT COMPATIBILITY

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

Solvent	24 hr weight gain, %	Solvent	24 hr weight gain, %
Acetic Acid 5%	0.2	Mineral oil (Heavy)	1.0
Acetone	0.2	Mineral oil (Light)	1.3
Bleach ~5% NaOCl	0.2	Salt Water (3.5% NaCl)	0.2
Butyl Acetate	0.2	Skydrol 5	0.8
Diesel Fuel	0.6	Sodium Hydroxide solution (0.025% PH 10)	0.2
Diethyl glycol Monomethyl Ether	0.5	Strong Acid (HCl conc)	0.8
Hydraulic Oil	1.0	Tripropylene glycol monomethyl ether	0.8
Hydrogen peroxide (3%)	0.2	Water	0.1
Isooctane (aka gasoline)	0.0		0.2
Isopropyl Alcohol	0.2	Xylene	

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

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

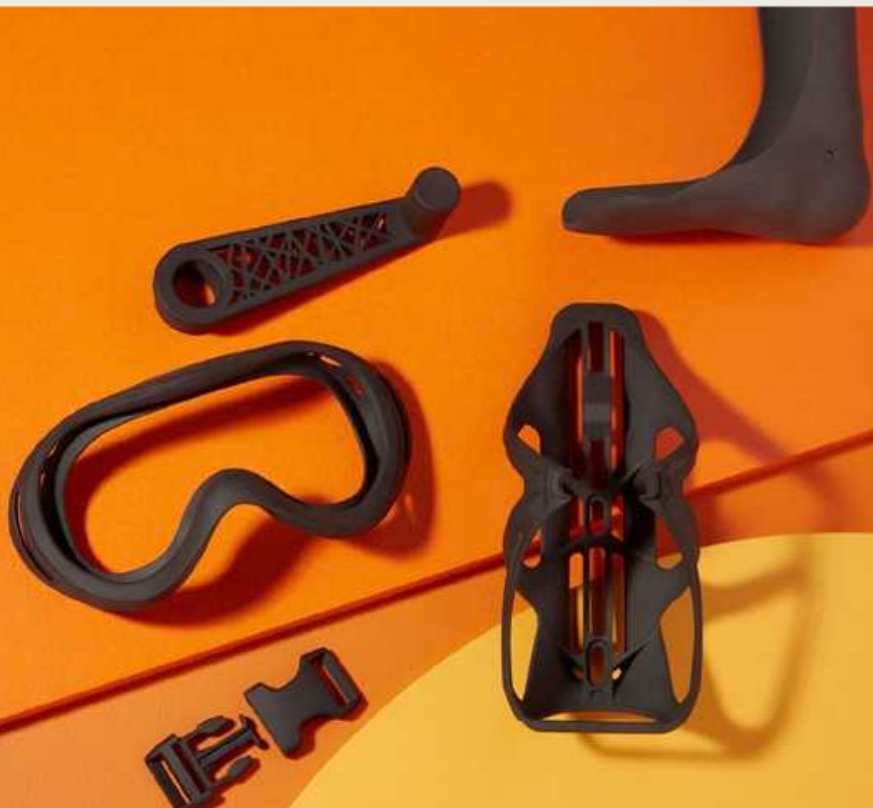
³ Material properties may vary based on part design and manufacturing practices. It is the manufacturer's responsibility to validate the suitability of the printed parts for the intended use.

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

Nylon 11 Powder

For ductile, robust parts, Nylon 11 Powder is a high performance, bio-based nylon material for functional prototyping and small batch production. Nylon 11 Powder is suitable for printing parts that need to bend or resist impact.

Nylon 11 Powder is specifically developed for use on the Fuse Series printers.



FLP11B01

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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.

Material Properties	METRIC ^{1,2}	IMPERIAL ^{1,2}	METHOD
Tensile Properties	METRIC ^{1,2}	IMPERIAL ^{1,2}	METHOD
Ultimate Tensile Strength	49 MPa	7107 psi	ASTM D638-14 Type 1
Tensile Modulus	1.6 GPa	232 ksi	ASTM D638-14 Type 1
Elongation at Break (X/Y)	40%		ASTM D638-14 Type 1
Flexural Properties	METRIC ^{1,2}	IMPERIAL ^{1,2}	METHOD
Flexural Strength	55 MPa	7977 psi	ASTM D790-15
Flexural Modulus	1.4 GPa	203 ksi	ASTM D790-15
Impact Properties	METRIC ^{1,2}	IMPERIAL ^{1,2}	METHOD
Notched Izod	71 J/m	1.3 ft-lb/in	ASTM D256-10
Thermal Properties	METRIC ^{1,2}	IMPERIAL ^{1,2}	METHOD
Heat Deflection Temp. @ 1.8 MPa Heat	46 °C	115 °F	ASTM D648-16
Deflection Temp. @ 0.45 MPa Vicat	182 °C	360 °F	ASTM D1525
Softening Temperature	189 °C	372 °F	METHOD
Other Properties	METRIC ^{1,2}	IMPERIAL ^{1,2}	ISO 15512 Method D
Moisture Content (powder)	0.37%		ASTM D570
Water Absorption (printed part)	0.07%		

Samples printed with Nylon 11 Powder have been evaluated in accordance with ISO 10993-1, and has passed the requirements for the following biocompatibility risks:

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

Flammability Properties

Testing Standard	Rating
UL 94 Section 7	HB *

* Thickness of the sample tested = 3.00mm

SOLVENT COMPATIBILITY

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

Solvent	24 hr weight gain, %	Solvent	24 hr weight gain, %
Acetic Acid 5%	0.1	Mineral oil (Light)	0.4
Acetone	0.1	Mineral oil (Heavy)	0.4
Bleach ~5% NaOCl	0.1	Salt Water (3.5% NaCl)	0.1
Butyl Acetate	0.1	Skydrol 5	0.2
Diesel Fuel	0.2	Sodium Hydroxide solution (0.025% pH 10)	0.1
Diethyl glycol Monomethyl Ether	0.4	Strong Acid (HCl conc)	1.0
Hydraulic Oil	0.5	Tripropylene glycol monomethyl ether	0.3
Hydrogen peroxide (3%)	< 0.1	Water	0.1
Isooctane (aka gasoline)	< 0.1	Xylene	0.1
Isopropyl Alcohol	0.1		

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

² Parts were printed using Fuse 1 with Nylon 11 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 11 Powder was tested at NAMSA World Headquarters, OH, USA.

Nylon 11 CF Powder

Get the best of nylon and carbon fiber with this highly stable, high-performance material, perfect for end-use applications that require both high stiffness and superior strength and can take an impact.

Nylon 11 CF Powder is specifically developed for use on the Fuse 1+ 30W.

Functional composite prototypes

Tooling, Jigs, Fixtures

**Replacement and spare alternatives
to metal parts**

High-impact equipment



FLP11C01

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Material Properties	METRIC ^{1,2}			IMPERIAL ^{1,2}			METHOD
	X	Y	Z	X	Y	Z	
Tensile Properties	METRIC ^{1,2}			IMPERIAL ^{1,2}			METHOD
Ultimate Tensile Strength	69 MPa	52 MPa	38 MPa	10 ksi	7.6 ksi	5.5 ksi	ASTM D638-14 Type 1
Tensile Modulus	5.3 GPa	2.8 GPa	1.6 GPa	770 ksi	410 ksi	240 ksi	ASTM D638-14 Type 1
Elongation at Break	9%	15%	5%	9%	15%	5%	ASTM D638-14 Type 1
Mechanical Properties	METRIC ^{1,2}			IMPERIAL ^{1,2}			METHOD
Flexural Strength	110 MPa			16 ksi			ASTM D790-15
Flexural Modulus	4.2 GPa			610 ksi			ASTM D790-15
Notched Izod	74 J/m			1.4 ft-lb/in			ASTM D256-10
Thermal Properties	METRIC ^{1,2}			IMPERIAL ^{1,2}			METHOD
Heat Deflection Temp. @ 1.8 MPa Heat	178 °C			352 °F			ASTM D648-16
Deflection Temp. @ 0.45 MPa Vicat	188 °C			370 °F			ASTM D648-16
Softening Temperature	188 °C			370 °F			ASTM D1525

Samples printed with Nylon 11 CF Powder have been evaluated in accordance with ISO 10993-1:2020 and is biologically safe for long term (>30 day) surface (intact skin) contacting devices. It has passed the requirements for the following biocompatibility risks:

ISO Standard	Description ^{3,4}
ISO 10993-5: 2009	Not cytotoxic
ISO 10993-23:2021	Not an irritant
ISO 10993-10:2021	Not a sensitizer

SOLVENT COMPATIBILITY

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

Solvent	24 hr weight gain, %	Solvent	24 hr weight gain, %
Acetic Acid 5%	0.2	Mineral oil, heavy	1.0
Acetone	0.2	Mineral oil, light	1.3
Bleach ~5% NaOCl	0.2	Salt Water (3.5% NaCl)	0.2
Butyl Acetate	0.2	Skydrol 5	0.8
Diesel Fuel	0.6	Sodium hydroxide solution (0.025% pH = 10)	0.2
Diethyl glycol monomethyl ether	0.5	Strong Acid (HCl Conc)	0.8
Hydraulic Oil	1.0	TPM	0.8
Hydrogen peroxide (3%)	0.2	Water	0.1
Isooctane	0.0	Xylene	0.2
Isopropyl Alcohol	0.2		

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

² Parts were printed using Fuse 1+ 30W, with Nylon 11 CF 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 11 CF Powder was tested at NAMSA World Headquarters, OH, USA.

TPU 90A Powder

Create flexible TPU parts with unmatched design freedom and ease. Balancing high elongation at break and superior tear strength, TPU 90A Powder enables you to produce flexible, skin-safe prototypes and end-use parts that withstand the demands of everyday use—all at a low cost per part thanks to a 20% refresh rate.

TPU 90A Powder is specifically developed for use on Fuse Series printers.

Wearables and soft-touch elements

Gaskets, seals, masks, belts, plugs, and tubes

Padding, dampers, cushions, and grippers

Soles, splints, orthotics, and prosthetics

Protective sports equipment



FLTP9G01

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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.

Properties

Samples printed with TPU 90A powder have been evaluated in accordance with ISO 10993-1:2018, and has passed the requirements for the following biocompatibility risks:

⁴ TPU 90A was tested at NAMS World Headquarters, OH, USA.

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%	1.3	Isooctane (aka gasoline)	0.7
Acetone	28.6	Mineral oil (light)	2.3
Isopropyl Alcohol	4.8	Mineral oil (Heavy)	2.1
Bleach ~5% NaOCl	0.8	Salt Water (3.5% NaCl)	0.9
Butyl Acetate	16.5	Sodium Hydroxide solution (0.025% PH 10)	0.9
Diesel Fuel	2.0	Water	0.9
Diethyl glycol Monomethyl Ether	14.4	Xylene	20.8
Hydraulic Oil	2.8	Strong Acid (HCl conc)	- 5.2
Skydrol 5	6.5	TPM	9.9
Hydrogen peroxide (3%)	1.0		