# Nylon 12 GF Formlabs Authorised Partner User Guide

formlabs

Contents



## SLS POWDERS

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### Nylon 12 GF Powder

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**For stiff, stable, functional parts.**

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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.

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**Fixtures Undergoing Long-Term Sustained Loading**

**Stiff Structural Components**

**End-Use Industrial Parts**

**Functional Prototypes for composite products**

**Thermally Stressed Housings**

**(V1) 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) | 4% | | ASTM D638-14 Type 1 |
| Elongation at Break (Z) | 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 | 113 °C | 235 °F | ASTM D648-16 |
| Heat Deflection Temp. @ 0.45 MPa | 170 °C | 338 °F | ASTM D648-16 |
| Vicat Softening Temperature | 175 °C | 347 °F | ASTM D1525 |
| **Other Properties** | **METRIC[1,2]** | **IMPERIAL[1,2]** | **METHOD** |
| Moisture Content (powder | 0.23% | | ISO 15512 Method D |
| Water Absorption (printed part) | 0.24% | | ASTM D570 |

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

[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.

## Documents / Resources

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|---|---|
|  | formlabs Nylon 12 GF Formlabs Authorised Partner [pdf] User Guide<br>V1 FLP12B01, Nylon 12 GF Formlabs Authorised Partner, Nylon 12 GF, Formlabs Authorised P artner, Authorised Partner, Partner |

## References

- **User Manual**