

# Nylon 12 GF Powder

For stiff, stable, functional parts.

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 1.*

**Fixtures Undergoing Long-Term Sustained Loading**

**Stiff Structural Components**

**End-Use Industrial Parts**

**Functional Prototypes for composite products**

**Thermally Stressed Housings**



**FLP12B01**

\* May not be available in all regions

Prepared 02 . 01. 2022

Rev. 01 02 . 01. 2022

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 DATA

Nylon 12 GF Powder

|                                  | METRIC <sup>1, 2</sup> | IMPERIAL <sup>1, 2</sup> | METHOD               |
|----------------------------------|------------------------|--------------------------|----------------------|
| Mechanical Properties            |                        |                          |                      |
| Ultimate Tensile Strength        | 38 MPa                 | 5510 psi                 | ASTM D 638-14 Type 1 |
| Tensile Modulus                  | 2800 MPa               | 406 ksi                  | ASTM D 638-14 Type 1 |
| Elongation at Break (X/Y)        | 4%                     | 4%                       | ASTM D 638-14 Type 1 |
| Elongation at Break (Z)          | 3%                     | 3%                       | ASTM D 638-14 Type 1 |
| Flexural Properties              |                        |                          |                      |
| Flexural Strength                | 56 MPa                 | 8122 psi                 | ASTM D 790-15        |
| Flexural Modulus                 | 2400 MPa               | 348 ksi                  | ASTM D 790-15        |
| Impact Properties                |                        |                          |                      |
| Notched IZOD                     | 36 J/m                 | 0.67 ft lb/in            | ASTM D256-10         |
| Thermal Properties               |                        |                          |                      |
| Heat Deflection Temp. @ 1.8 MPa  | 113°C                  | 235°F                    | ASTM D 648-16        |
| Heat Deflection Temp. @ 0.45 MPa | 170°C                  | 338°F                    | ASTM D 648-16        |
| Vicat Softening Temperature      | 175°C                  | 347°F                    | ASTM D1525           |
| Other Properties                 |                        |                          |                      |
| Moisture Content (powder)        | 0.23%                  | 0.23%                    | ISO 15512 Method D   |
| Water Absorption (printed part)  | 0.24%                  | 0.24%                    | ASTM D570            |

<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 GF powder. Parts were conditioned at 50% relative humidity and 23 °C for 7 days before testing.

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)                      | 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                  | Xylene                                   | 0.2                  |
| Isopropyl Alcohol               | 0.2                  |                                          |                      |