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SLS POWDERS

# Nylon 11 CF Powder

## Carbon Fiber Reinforced, for Strong and Lightweight parts

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**

V1 **FLP11C01**

* **May not be available in all regions**

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## MATERIAL PROPERTIES DATA

**Nylon 11 CF Powder**

| | METRIC [1,2] | | | IMPERIAL [1,2] | | | METHOD |
|---|---|---|---|---|---|---|---|
| **Tensile Properties** | X | Y | Z | X | Y | Z | |
| Ultimate Tensile Strength | 69 MPa | 52 MPa | 38 MPa | 10 ksi | 7.6 ksi | 5.5 ksi | ASTM D 638-14 Type 1 |
| Tensile Modulus | 5.3 GPa | 2.8 GPa | 1.6 GPa | 770 ksi | 410 ksi | 240 ksi | ASTM D 638-14 Type 1 |
| Elongation at Break | 9% | 15% | 5% | 9% | 15% | 5% | ASTM D 638-14 Type 1 |
| **Mechanical Properties** | | | | | | | |
| Flexural Strength | 110 MPa | | | 16 ksi | | | ASTM D 790-15 |
| Flexural Modulus | 4.2 GPa | | | 610 ksi | | | ASTM D 790-15 |
| Notched Izod | 74 J/m | | | 1.4 ft-lb/in | | | ASTM D256-10 |
| **Thermal Properties** | | | | | | | |
| Heat Deflection Temp. @ 1.8 MPa | 178 °C | | | 352 °F | | | ASTM D 648-16 |
| Heat Deflection Temp. @ 0.45 MPa | 188 °C | | | 370 °F | | | ASTM D 648-16 |
| Vicat Softening Temperature | 188 °C | | | 370 °F | | | ASTM D 1525 |

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 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.