

# Formlabs Nylon 11 Powder

Selective Laser Sintering | PA11 | powder

Compiled by FabDigit from manufacturer technical data. Values below belong to this named product; unreported properties are omitted.

## Manufacturer: Formlabs

Source revision: Rev 01 2021-06-05

Recorded system family: Fuse 1+ 30W, Fuse 1

As-printed colour: Dark Gray / Black. Sold as Nylon 11 Powder Black (Formlabs SKU PD-FS-P11B-01); parts print a deep charcoal between dark gray and black

Test values are typical reported results, not guaranteed design allowables or finished-part certification. Review the complete source for specimen preparation, orientation and conditioning.

Test basis: Fuse 1; specimens conditioned at 23 deg C and 50% relative humidity for 7 days before testing.

Direction: Elongation is reported for X/Y only (40%); the TDS provides no Z elongation result. The other table values do not state an orientation.

## Mechanical

| PROPERTY                    | VALUE          | TEST / CONDITION                |
|-----------------------------|----------------|---------------------------------|
| Tensile Strength (Ultimate) | <b>49 MPa</b>  | per ASTM D638-14 Type 1         |
| Elastic (Young's) Modulus   | <b>1.6 GPa</b> | per ASTM D638-14 Type 1         |
| Elongation at Break         | <b>40 %</b>    | per ASTM D638-14 Type 1; X/Y 40 |
| Flexural Strength           | <b>55 MPa</b>  | per ASTM D790-15                |
| Flexural Modulus            | <b>1.4 GPa</b> | per ASTM D790-15                |
| Izod Impact, Notched        | <b>71 J/m</b>  | per ASTM D256-10                |

## Thermal

| PROPERTY                         | VALUE            | TEST / CONDITION |
|----------------------------------|------------------|------------------|
| Heat Deflection Temp. @ 1.8 MPa  | <b>46 deg C</b>  | per ASTM D648-16 |
| Heat Deflection Temp. @ 0.45 MPa | <b>182 deg C</b> | per ASTM D648-16 |
| Vicat Softening Point (B50)      | <b>189 deg C</b> | per ASTM D1525   |
| Flammability (UL 94)             | <b>HB</b>        | 3.00 mm          |

## Physical

| PROPERTY                             | VALUE         | TEST / CONDITION            |
|--------------------------------------|---------------|-----------------------------|
| Water absorption (manufacturer test) | <b>0.07 %</b> | per ASTM D570; printed part |

## Manufacturability

| PROPERTY                | VALUE         | TEST / CONDITION       |
|-------------------------|---------------|------------------------|
| Powder Moisture Content | <b>0.37 %</b> | per ISO 15512 Method D |

## Solvent compatibility screen

24 h immersion mass change reported by the manufacturer

| Solvent            | 24 h weight gain |
|--------------------|------------------|
| Acetic acid 5%     | 0.1%             |
| Acetone            | 0.1%             |
| Bleach (~5% NaOCl) | 0.1%             |
| Butyl acetate      | 0.1%             |

## Solvent compatibility screen - continued

| Solvent                                   | 24 h weight gain |
|-------------------------------------------|------------------|
| Diesel fuel                               | 0.2%             |
| Diethyl glycol monomethyl ether           | 0.4%             |
| Hydraulic oil                             | 0.5%             |
| Hydrogen peroxide (3%)                    | <0.1%            |
| Isooctane (gasoline)                      | <0.1%            |
| Isopropyl alcohol                         | 0.1%             |
| Mineral oil (light)                       | 0.4%             |
| Mineral oil (heavy)                       | 0.4%             |
| Salt water (3.5% NaCl)                    | 0.1%             |
| Skydrol 5                                 | 0.2%             |
| Sodium hydroxide solution (0.025%, pH 10) | 0.1%             |
| Strong acid (concentrated HCl)            | 1.0%             |
| Tripropylene glycol monomethyl ether      | 0.3%             |
| Water                                     | 0.1%             |
| Xylene                                    | 0.1%             |

TDS test article: 1 x 1 x 1 cm cube described as printed and post-cured. No SLS post-cure procedure is defined. This wording does not establish an SLS post-cure requirement. Weight change alone does not establish sealing, retained strength, or long-term chemical life.

## Biocompatibility endpoint results

ISO 10993 endpoints listed in the manufacturer TDS

| Standard / endpoint                      | Result           |
|------------------------------------------|------------------|
| ISO 10993-5:2009                         | Not cytotoxic    |
| ISO 10993-10:2010(R)2014 - irritation    | Not an irritant  |
| ISO 10993-10:2010(R)2014 - sensitization | Not a sensitizer |

Manufacturer material-sample result. It does not qualify a finished part or device for its intended use.

## Selection and finishing

A ductile, bio-based Formlabs PA11 for SLS parts that must bend, absorb impact or survive a compliant feature.

Design: Prototype the actual flex radius, wall and orientation rather than treating coupon elongation as hinge life. Confirm conditioning and service temperature for critical fits.

Finishing: Dark Gray / Black is the powder's as-printed colour, not a dye selection. A blast or smoothing step can change gloss and texture, so approve appearance on a sample.

## Source and document scope

### Formlabs manufacturer source reference - Rev 01 2021-06-05

<https://formlabs-media.formlabs.com/datasheets/2101560-TDS-ENUS-0.pdf>

The reviewed reference copy is labeled Rev 02 with the same 2021-06-05 date, while the current live official PDF is labeled Rev 01. The checked property values are unchanged.

FabDigit product page: <https://www.fabdigit.com/materials/polymer-pa11/formlabs-nylon-11/>

FabDigit is the publisher of this reference summary. The named manufacturer remains the source of the material data. This document is not a manufacturer-issued TDS, a certificate of conformity or a test report for an ordered part. Confirm the exact product, system, orientation, conditioning and final finish with the quote.