

Print date: 18-09-2023

Version: 1.0

Product specifications

Our STYX PA6-CF15 combines all benefits of STYX PA6 filament plus 15% carbon fibers.

STYX PA6-CF15 is a high-performance carbon fiber reinforced PA6 filament. The use of high modulus carbon fibers result in an unmatched strength and stiffness. This engineering filament is very easy to 3D print on open desktop machines. No enclosure, or heated chamber needed. Its low shrinkage factor and perfect layer adhesion make STYX PA6-CF15 a breeze to print with.

Important key features

- 200% stiffer than standard PA6
- Heat resistant up to 180°C
- High strength and resistance to abrasion.
- High chemical and corrosion resistance
- Easy to print on open desktop 3D printers

Suitable applications

- Creating parts for automotive
- High performance functional components
- Gear wheels, bearings, and sliding elements
- 3D printing machinery parts
- Dynamically stressed parts

Carbon fiber reinforcement explained

Reinforcing filaments with carbon results in great benefits. It combines the unique properties of both materials. The properties of the thermoplastic improve with everything carbon fibers offer. Carbon fibers offer lots of benefits, such as:

- Increasing stiffness
- Reducing weight
- Increasing tensile strength
- Increasing dimensional stability
- Reducing shrinkage / warping
- Increasing heat resistance
- Increasing chemical resistance
- Masking layer lines with a matt surface finish in 3D printed objects

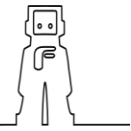
This makes carbon fiber reinforced filaments perfect for 3D printing applications that require stiffness and lightweight properties.

Material properties	Typical value	Test Method
Density	1.18 g/cm ³	ISO 1183
Moisture Absorption (23 °C / 50% r.h.)	2,5%	ISO 62
Water Absorption (23 °C / saturation in water)	8%	ISO 62

Mechanical properties

Tensile strength (23°C, 50mm/min)	120 MPa	ISO 527-1
Tensile modulus (23 °C, 50 mm/min)	9000 MPa	ISO 527-1
Elongation at break (23°C, 50mm/min)	4%	ISO 527-1
Flexural Modulus (23 °C, 2 mm/min)	8000 MPa	ISO 178
Flexural Strength (23 °C, 2 mm/min)	180 MPa	ISO 178
Charpy unnotched impact strength, 23°C	60 KJ/m ²	ISO 179/1eU
Charpy notched impact strength, 23°C	4 KJ/m ²	ISO 179/1eU





Thermal properties

Heat deflection temperature (HDT) @ 1.8MPa	65°C	ISO 75
Heat deflection temperature (HDT) @ 0.45MPa	180°C	ISO 75

Drying recommended

PA6 is a hygroscopic thermoplastic material and will attract and hold water molecules from the surrounding environment. For optimal printing results it is recommended to dry the filament before usage and even 3D print from a dry box for larger prints. This will ensure optimal material properties.

Abrasiveness

Please be aware that carbon fiber reinforced filaments contain a relatively high concentration of extremely hard carbon fibers, which have an abrasive nature. In general these carbon fibers will accelerate the nozzle-wear of brass nozzles, much faster than unfilled filaments. We recommend to use ruby nozzles or hardened steel nozzles.

Storage and handling

Filament should be stored at room temperature in a dry and dark place with humidity below 15%. Recommended storage temperature is ca. 18-25°C (64.4 -77.0°F). Keep out of moisture, sunlight and direct heat. When stored properly, product has a shelf life of 24 months. To obtain the best parameters of the printed object, it is recommended to dry the material prior to usage and to 3D print it directly from a dry box.

Product export information

HS Code	Description	Origin
39169090	Monofilament for 3D printing	European Union

Disclaimer

The product- and technical data provided in this datasheet is correct to the best of FormFutura BV's knowledge and are intended for reference and comparison purposes only. Actual values may vary according to printing conditions, model complexity, environmental conditions, etcetera. Typical values are indicative only and are not to be construed as being binding specifications. All other information supplied, including that herein, is considered accurate but is furnished upon the express condition that the customer shall make its own assessment to determine a product's suitability for a particular purpose. We make no warranty, express or implied, including regarding any information supplied or the data upon which it is based or the results to be obtained from the use of such products or information, or concerning product, whether of satisfactory quality, merchantability, fitness for any particular purpose or otherwise, or with respect to intellectual property infringement as a result of use of information or products, and none shall be implied.

