

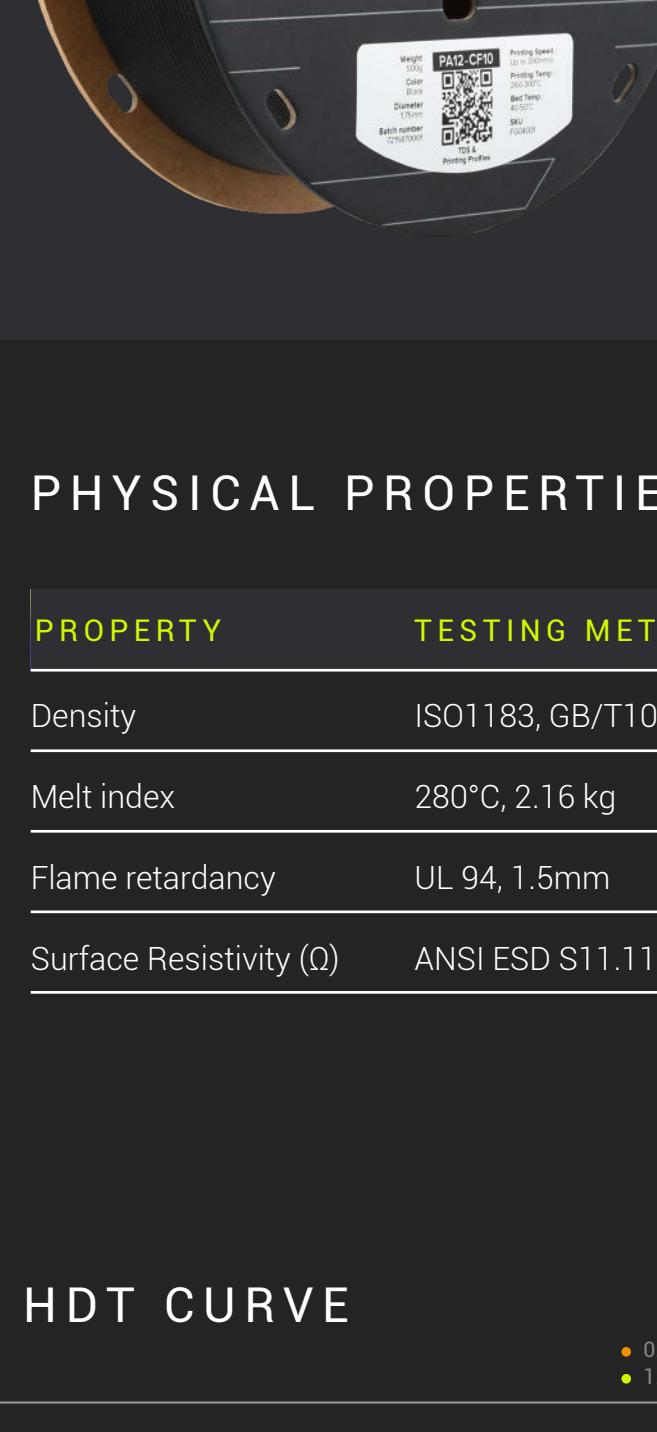
# TECHNICAL DATA SHEET

V1.1



**FIBERON**

By polymaker



## FIBERON™ PA12-CF10

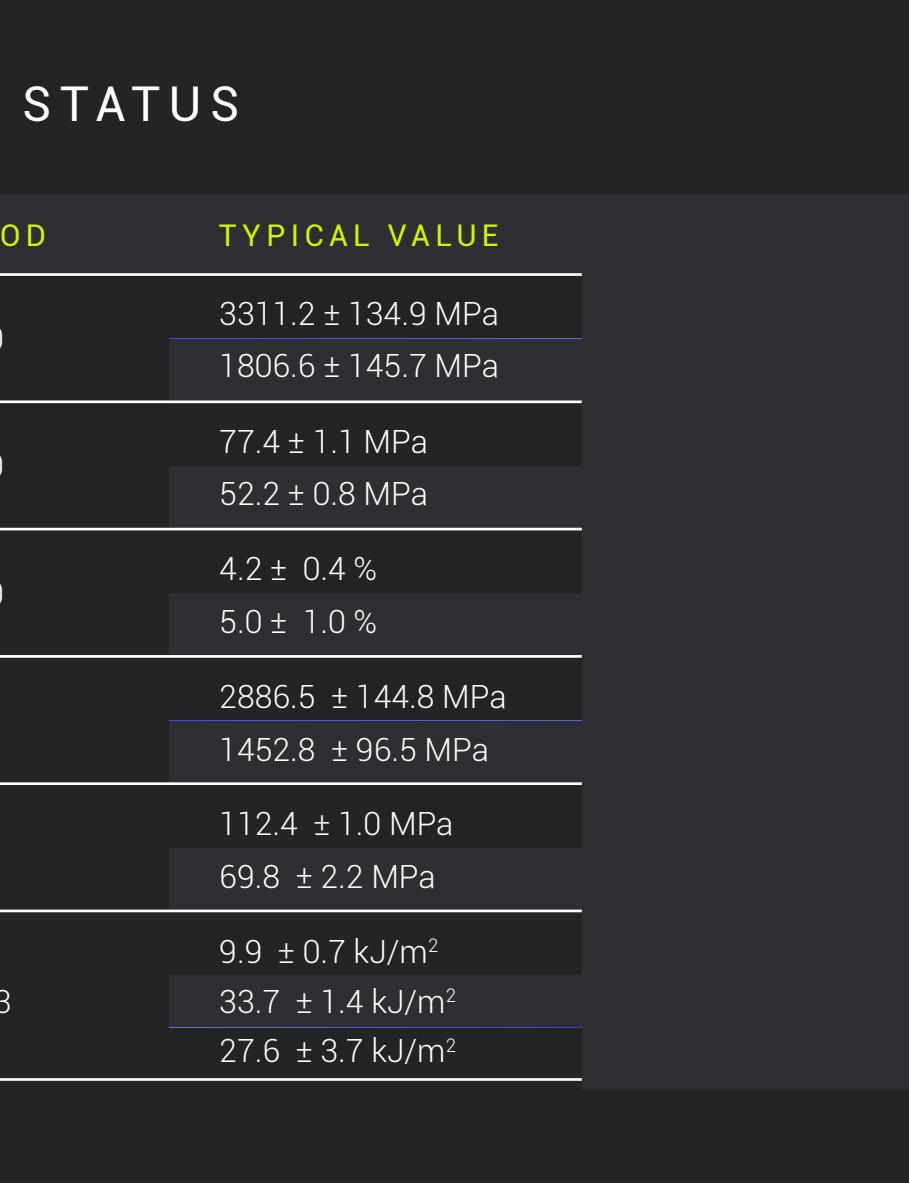
Fiberon™ PA12-CF10 is carbon fiber reinforced long chain copolyimide filament. Thanks to its chemical structure, this product has lower moisture sensitivity compared to PA6/66 and PA6-based materials, and better mechanical properties than PA12-based materials. In addition, the carbon fiber reinforcement and Warp-free™ technology enhance the size stability of the prints produced with this material.

[WWW.FIBERON3D.COM](http://WWW.FIBERON3D.COM)

### PHYSICAL PROPERTIES

| PROPERTY                | TESTING METHOD    | TYPICAL VALUE                  |
|-------------------------|-------------------|--------------------------------|
| Density                 | ISO1183, GB/T1033 | 1.06 g/cm <sup>3</sup> at 23°C |
| Melt index              | 280°C, 2.16 kg    | 25.0 g/10min                   |
| Flame retardancy        | UL 94, 1.5mm      | HB                             |
| Surface Resistivity (Ω) | ANSI ESD S11.11   | OL, >10 <sup>12</sup> Ω        |

### MOISTURE ABSORPTION CURVE



### HDT CURVE



### THERMAL PROPERTIES

| PROPERTY               | TESTING METHOD     | TYPICAL VALUE |
|------------------------|--------------------|---------------|
| Glass transition temp. | DSC, 10°C/min      | 55 °C         |
| Melting temperature    | DSC, 10°C/min      | 171 °C        |
| Crystallization temp.  | DSC, 10°C/min      | 120 °C        |
| Decomposition temp.    | TGA, 20°C/min      | 445.2 °C      |
| Vicat softening temp.  | ISO 306, GB/T 1633 | 170.2 °C      |
| Heat deflection temp.  | ISO 75 1.8MPa      | 105 °C        |
| Heat deflection temp.  | ISO 75 0.45MPa     | 131 °C        |

### MECHANICAL PROPERTIES - DRY STATUS

| PROPERTY                                | TESTING METHOD     | TYPICAL VALUE                |
|---|--------------------|------------------------------|
| Young's modulus (X-Y)                   | ISO 527, GB/T 1040 | 3311.2 ± 134.9 MPa           |
| Young's modulus (Z)                     | ISO 527, GB/T 1040 | 1806.6 ± 145.7 MPa           |
| Tensile strength (X-Y)                  | ISO 527, GB/T 1040 | 77.4 ± 1.1 MPa               |
| Tensile strength (Z)                    | ISO 527, GB/T 1040 | 52.2 ± 0.8 MPa               |
| Elongation at break (X-Y)               | ISO 527, GB/T 1040 | 4.2 ± 0.4 %                  |
| Elongation at break (Z)                 | ISO 527, GB/T 1040 | 5.0 ± 1.0 %                  |
| Bending modulus (X-Y)                   | ISO 178, GB/T 9341 | 2886.5 ± 144.8 MPa           |
| Bending modulus (Z)                     | ISO 178, GB/T 9341 | 1452.8 ± 96.5 MPa            |
| Bending strength (X-Y)                  | ISO 178, GB/T 9341 | 112.4 ± 1.0 MPa              |
| Bending strength (Z)                    | ISO 178, GB/T 9341 | 69.8 ± 2.2 MPa               |
| Charpy impact strength (X-Y) notched    | ISO 179, GB/T 1043 | 9.9 ± 0.7 kJ/m <sup>2</sup>  |
| Charpy impact strength (X-Y) un-notched | ISO 179, GB/T 1043 | 33.7 ± 1.4 kJ/m <sup>2</sup> |
| Charpy impact strength (Z) un-notched   | ISO 179, GB/T 1043 | 27.6 ± 3.7 kJ/m <sup>2</sup> |

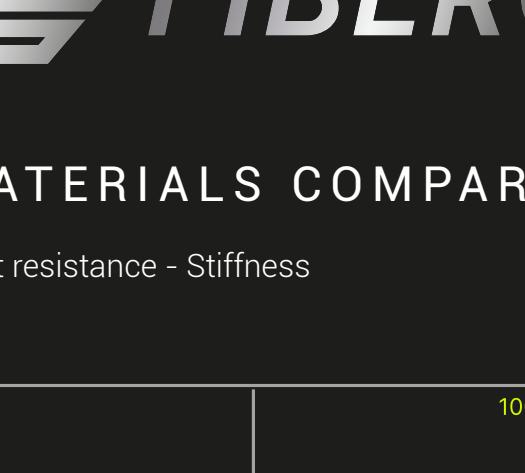
\*All specimens were annealed at 100°C for 16h.

### MECHANICAL PROPERTIES - WET STATUS

| PROPERTY                                | TESTING METHOD     | TYPICAL VALUE                |
|---|--------------------|------------------------------|
| Young's modulus (X-Y)                   | ISO 527, GB/T 1040 | 3131.7 ± 124.2 MPa           |
| Young's modulus (Z)                     | ISO 527, GB/T 1040 | 1622.0 ± 71.7 MPa            |
| Tensile strength (X-Y)                  | ISO 527, GB/T 1040 | 71.7 ± 0.7 MPa               |
| Tensile strength (Z)                    | ISO 527, GB/T 1040 | 42.1 ± 1.8 MPa               |
| Elongation at break (X-Y)               | ISO 527, GB/T 1040 | 5.3 ± 0.3 %                  |
| Elongation at break (Z)                 | ISO 527, GB/T 1040 | 5.3 ± 1.2 %                  |
| Bending modulus (X-Y)                   | ISO 178, GB/T 9341 | 2652.7 ± 57.2 MPa            |
| Bending modulus (Z)                     | ISO 178, GB/T 9341 | 1145.9 ± 76.9 MPa            |
| Bending strength (X-Y)                  | ISO 178, GB/T 9341 | 91.8 ± 1.5 MPa               |
| Bending strength (Z)                    | ISO 178, GB/T 9341 | 52.2 ± 1.5 MPa               |
| Charpy impact strength (X-Y) notched    | ISO 179, GB/T 1043 | 10.2 ± 0.8 kJ/m <sup>2</sup> |
| Charpy impact strength (X-Y) un-notched | ISO 179, GB/T 1043 | 41.2 ± 4.4 kJ/m <sup>2</sup> |
| Charpy impact strength (Z) un-notched   | ISO 179, GB/T 1043 | 20.6 ± 4.7 kJ/m <sup>2</sup> |

\*All specimens were annealed at 100°C for 16h, and immersed in water at 60°C for 48h prior to testing. The average moisture content of specimens is 2.92%.

### SHRINKAGE TESTING



| MODEL SIZE | AFTER PRINTING | AFTER ANNEALING |
|------------|----------------|-----------------|
| X-Y        | 40mm           | 39.88mm         |
| Z          | 40mm           | 39.79mm         |
| Diameter   | 10mm           | 9.91mm          |

\*Model infill 30%

### RECOMMENDED PRINTING CONDITIONS

|                         |            |
|-------------------------|------------|
| Nozzle temperature      | 280-300 °C |
| Build plate temperature | 40-50 °C   |
| Chamber temperature     | Room Temp. |
| Cooling fan             | OFF        |

|                          |               |
|--------------------------|---------------|
| Printing speed           | Up to 300mm/s |
| Drying temp. and time    | 100 °C/10H    |
| Annealing temp. and time | 100 °C/16H    |

PolySupport™ for PA12  
PolyDissolve™ S1  
Recommended support material

NOTE

Abrasion of the brass nozzle happens frequently when printing Fiberon™ PA12-CF10. Normally, the life of a brass nozzle would be approximately 9h. A wear-resistance nozzle, such as hardened steel and ruby nozzle, is highly recommended to be used with Fiberon™ PA12-CF10.

Fiberon™ PA12-CF10 is sensitive to moisture and should always be stored and used under dry conditions (relative humidity below 20%).

If Fiberon™ PA12-CF10 is used as the support material for itself, please remove the support structure before excessive moisture absorption. Otherwise, the support structure can be permanently bonded to the model.

After the printing process, it is recommended to anneal the model in the oven at 100°C for 16 hours.

### HOW TO MAKE SPECIMENS

|                      |        |
|----------------------|--------|
| Printing temperature | 300 °C |
| Bed temperature      | 50 °C  |
| Top & bottom layer   | 3      |
| Infill               | 100%   |

|             |     |
|-------------|-----|
| Shell       | 2   |
| Cooling fan | OFF |

