HEXON PA CF

Technical Data Sheet



HEXON – Carbon-Fiber-Reinforced PA Filament for Markforged Systems

Overview
HEXON is a carbon-fiber-reinforced polyamide (PA) filament designed as a high-performance alternative for Markforged printers.

It provides **increased heat resistance**, **higher stiffness**, and **excellent dimensional stability**, making it suitable for structurally loaded parts in industrial environments.

Key Technical Characteristics

- **High stiffness and strength** for load-bearing components
- **Consistent dimensional accuracy** during printing
- **Fully compatible with Markforged fiber reinforcement types**

Typical Applications

- Jigs, fixtures, and production aids
- Brackets and structural machine components
- Functional prototypes requiring high stiffness
- Low-volume end-use parts

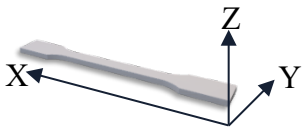
Raw Material Properties	Value	Test Method
Density	1.15 g/cm³	ISO 1183-1

The mechanical properties of polyamide based materials change with the amount of water absorption from the environment. Therefore, the presented mechanical and thermal properties of this technical data sheet are measured after two different pre-treatment methods of the test specimens:

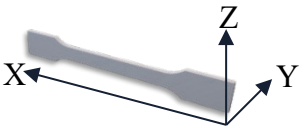
- Dry: specimens are dried at 80°C in a vacuum oven until weight constancy
- Conditioned: specimens are dried at 80°C until weight constancy and afterwards conditioned at 70°C and 62% relative humidity for 336 hours (2 weeks).

The tested specimens are printed in different build directions to show the anisotropic behavior of printed structures. Please note that the given values are typical values only, which are not intended for design or specification purposes. Test parts were printed on a Markforged Onyx One (Gen 2) under standard parameters.

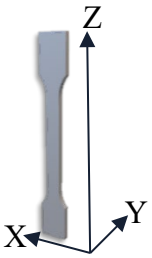
XY-Direction



XZ-Direction



ZX-Direction



Mechanical Properties (Dry)	XY-direction	XZ-direction	ZX-direction	Test Method
Tensile Modulus	3480 MPa	7050 MPa	2850 MPa	ASTM D638
Tensile Strength, Yield	60.7 MPa	111.0 MPa	27.2 MPa	ASTM D638
Tensile Elongation at Yield	3.5 %	3.1 %	1.0 %	ASTM D638
Tensile Elongation at Break	3.8 %	3.1 %	1.0 %	ASTM D638
Impact Strength IZOD, unnotched	30.9 J/m	31.8 J/m	3.4 J/m	ASTM D256* 1U
Impact Strength IZOD, notched	17.9 J/m	12.7 J/m	1.5 J/m	ASTM D256* 1A(F)
Flexural Modulus	3180 MPa	7930 MPa	2100 MPa	ASTM D790*
Flexural Strength	102.0 MPa	181.0 MPa	59.5 MPa	ASTM D790*
Flexural Strain	> 8 %	4.3 %	2.9 %	ASTM D790*

Thermal Properties (Dry)	Value	Test Method
Heat Deflection (HDT) @ 0,45 MPa	167 °C	ASTM D648
Heat Deflection (HDT) @ 1,82 MPa	104 °C	ASTM D648

Mechanical Properties (Conditioned)	XY-direction	XZ-direction	ZX-direction	Test Method
Tensile Modulus	866 MPa	2140 MPa	617 MPa	ASTM D638
Tensile Strength, Yield	33.1 MPa (max. Strength)	47.8 MPa	20.4 MPa	ASTM D638
Tensile Elongation at Yield	-	9.1 %	6.8 %	ASTM D638
Tensile Elongation at Break	45.0 %	15.0 %	6.8 %	ASTM D638
Impact Strength IZOD, unnotched	No break	No break	7.7 J/m	ASTM D256* 1U
Impact Strength IZOD, notched	45.4 J/m	41.7 J/m	4.0 J/m	ASTM D256* 1A(F)
Flexural Modulus	857 MPa	tbd	484 MPa	ASTM D790*
Flexural Strength	29.7 MPa @ 8 % strain	tbd	21.2 MPa @ 8 % strain	ASTM D790*
Flexural Strain	> 8 %	tbd	> 8 %	ASTM D790*

Thermal Properties (Conditioned)	Value	Test Method
Heat Deflection (HDT) @ 0,45 MPa	147 °C	ASTM D648
Heat Deflection (HDT) @ 1,82 MPa	105 °C	ASTM D648

* The measurements are in accordance with ASTM standards, but not fully compliant.

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