



# FDM Nylon 12CF

## DATA SHEET

FDM Nylon 12CF™ is a carbon-filled thermoplastic with excellent structural characteristics. The material is comprised of a blend of Nylon 12 resin and chopped carbon fiber, at a loading of 35% by weight. This combination produces one of the strongest thermoplastics in the FDM® material portfolio. It has the highest flexural strength of any FDM thermoplastic, resulting in the highest stiffness-to-weight ratio.

Appropriate uses include strong but lightweight tooling applications and functional prototypes in the aerospace, automotive, industrial and recreational manufacturing industries. FDM Nylon 12CF is available on the Fortus 450mc™ 3D Printer and is compatible with SR-110™ support material.



LEARN MORE ABOUT FDM NYLON 12CF AT [STRATASYS.COM](https://www.stratasys.com)



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### At the core:

#### Advanced FDM Technology

FDM (fused deposition modeling) technology works with engineering-grade thermoplastics to build strong, long-lasting and dimensionally stable parts with the best accuracy and repeatability of any 3D printing technology. These parts are tough enough to be used as advanced conceptual models, functional prototypes, manufacturing tools and production parts.

#### Meet production demands

FDM systems are as versatile and durable as the parts they produce. Advanced FDM 3D Printers boast the largest build envelopes and material capacities in their class, delivering longer, uninterrupted build times, bigger parts and higher quantities than other additive manufacturing systems, delivering high throughput, duty cycles and utilization rates.

#### Opening the way for new possibilities

FDM 3D Printers streamline processes from design through manufacturing, reducing costs and eliminating traditional barriers along the way. Industries can cut lead times and costs, products turn out better and get to market faster.

#### No special facilities needed

FDM 3D Printers are easy to operate and maintain compared to other additive fabrication systems because there are no messy powders or resins to handle and contain, and no special venting is required because FDM systems don't produce noxious fumes, chemicals or waste.

MECHANICAL PROPERTIES <sup>1</sup>	TEST METHOD	ENGLISH		METRIC	
		XZ Axis	ZX Axis	XZ Axis	ZX Axis
Tensile Strength, Yield (Type 1, 0.125", 0.2"/min) PSI	ASTM D638	9,190 psi	4,170 psi	63.4 MPa	28.8 MPa
Tensile Strength, Ultimate (Type 1, 0.125", 0.2"/min) PSI	ASTM D638	10,960 psi	4,990 psi	75.6 Mpa	34.4 MPa
Tensile Modulus (Type 1, 0.125", 0.2"/min) PSI	ASTM D638	1.1 Msi	0.33 Msi	7515 MPa	2300 MPa
Tensile Elongation at Break (Type 1, 0.125", 0.2"/min) %	ASTM D638	1.9%	1.2%	1.9%	1.2%
Tensile Elongation at Yield (Type 1, 0.125", 0.2"/min) %	ASTM D638	0.9%	1.1%	0.9%	1.1%
Flexural Strength (Method 1, 0.05"/min) PSI	ASTM D790	20,660 psi	8,430 psi	142 MPa	58.1 MPa
Flexural Modulus (Method 1, 0.05"/min) PSI	ASTM D790	1.5 Msi	0.3 Msi	10,620 Mpa	1830 MPa
Flexural Strain at Break (Method 1, 0.05"/min) PSI	ASTM D790	3%	3%	3%	3%
IZOD Impact, notched (Method A, 23 °C) ft-lbf/in	ASTM D256	1.6 ft-lb/in	0.4 ft-lb/in	85 J/m	21.4 J/m
IZOD Impact, un-notched (Method A, 23 °C) ft-lbf/in	ASTM D256	5.8 ft-lb/in	1.6 ft-lb/in	310 J/m	85 J/m

THERMAL PROPERTIES <sup>2</sup>	TEST METHOD	ENGLISH	METRIC
Heat Deflection (HDT) @ 264 psi	ASTM D648	289 °F	143 °C
Glass Transition Temperature (Tg)	DMA (SSYS)	105 °F	41 °C
Coefficient of Thermal Expansion (flow) at 104 °F (40 °C)	ASTM E831	14 µin/(in·°F)	25 µm/(m·°C)
Coefficient of Thermal Expansion (flow) at 212 °F (100 °C)	ASTM E831	15 µin/(in·°F)	27 µm/(m·°C)
Coefficient of Thermal Expansion (xflow) at 104 °F (40 °C)	ASTM E831	83 µin/(in·°F)	150 µm/(m·°C)
Coefficient of Thermal Expansion (xflow) (flow) at 212 °F (100 °C)	ASTM E831	167 µin/(in·°F)	300 µm/(m·°C)
Melting Temperature		433 °F	223 °C

ELECTRICAL PROPERTIES	TEST METHOD	VALUE
Volume Resistivity (kOhms)	ASTM D257	5.4E+03 - 3.9E+04
Surface Resistivity (kOhms)	ASTM D257	3.3E+03 - 6.9E+04



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OTHER	TEST METHOD	VALUE
Specific Gravity	ASTM D792	1.15

SYSTEM AVAILABILITY	LAYER THICKNESS CAPABILITY	SUPPORT STRUCTURE	AVAILABLE COLORS
Fortus 450mc	0.010"	Soluble	Black

The information presented are typical values intended for reference and comparison purposes only. They should not be used for design specifications or quality control purposes. End-use material performance can be impacted (+/-) by, but not limited to, part design, end-use conditions, test conditions, etc. Actual values will vary with build conditions. Tested parts were built on Fortus 450mc @ 0.010" (0.254 mm) slice. Product specifications are subject to change without notice.

The performance characteristics of these materials may vary according to application, operating conditions or end use. Each user is responsible for determining the Stratasys material is safe, lawful and technically suitable for the intended application, as well as for identifying the proper disposal (or recycling) method consistent with applicable environmental laws and regulations. Stratasys makes no warranties of any kind, express or implied, including, but not limited to, the warranties of merchantability, fitness for a particular use or warranty against patent infringement.

<sup>1</sup> Build orientation is on side long edge.

<sup>2</sup> Literature value unless otherwise noted.

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