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™ and Stratasys F900™ 3D Printers and is compatible with SR-110™ support material.

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.

LEARN MORE ABOUT FDM NYLON 12CF AT STRATASYS.COM

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MECHANICAL PROPERTIES[1]	TEST METHOD	*XZ Axis*	*ZX Axis*
Tensile Strength, Yield (Type 1, 0.125”, 0.2”/min) PSI	ASTM D638	63.4 MPa	28.8 MPa
Tensile Strength, Ultimate (Type 1, 0.125”, 0.2”/min) PSI	ASTM D638	75.6 Mpa	34.4 MPa
Tensile Modulus (Type 1, 0.125”, 0.2”/min) PSI	ASTM D638	7515 MPa	2300 MPa
Tensile Elongation at Break (Type 1, 0.125”, 0.2”/min) %	ASTM D638	1.9%	1.2%
Tensile Elongation at Yield (Type 1, 0.125”, 0.2”/min) %	ASTM D638	0.9%	1.1%
Flexural Strength (Method 1, 0.05”/min) PSI	ASTM D790	142 MPa	58.1 MPa
Flexural Modulus (Method 1, 0.05”/min) PSI	ASTM D790	10,620 Mpa	1830 MPa
Flexural Strain at Break (Method 1, 0.05”/min) PSI	ASTM D790	3%	3%
IZOD Impact, notched (Method A, 23 °C) ft-lbf/in	ASTM D256	85 J/m	21.4 J/m
IZOD Impact, un-notched (Method A, 23 °C) ft-lbf/in	ASTM D256	310 J/m	85 J/m
Compression Strength, Ultimate (Method 1, 0.050 in./min) psi	ASTM D695-15	67 MPa (9,670 psi)	92 MPa (13,310 psi)
Compression Modulus (Method 1, 0.050 in./min) psi	ASTM D695-15	2,670 MPa (387,720 psi)	2,170 MPa (314,740 psi)

THERMAL PROPERTIES[2]	TEST METHOD	VALUE
Heat Deflection (HDT) @ 264 psi	ASTM D648	143 °C
Glass Transition Temperature (Tg)	DMA (SSYS)	41 °C
Coefficient of Thermal Expansion (flow) at 104 °F (40 °C)	ASTM E831	25 µm/(m·°C)
Coefficient of Thermal Expansion (flow) at 212 °F (100 °C)	ASTM E831	27 µm/(m·°C)
Coefficient of Thermal Expansion (xflow) at 104 °F (40 °C)	ASTM E831	150 µm/(m·°C)
Coefficient of Thermal Expansion (xflow) at 212 °F (100 °C)	ASTM E831	300 µm/(m·°C)
Melting Temperature		178 °C

ELECTRICAL PROPERTIES	TEST METHOD	VALUE
Volume Resistivity (Ohms-cm)	ASTM D257	1.4E+05 - 1.012E+06
Surface Resistivity (Ohms/square)	ASTM D257	3.3E+04 - 6.9E+05

OTHER	TEST METHOD	VALUE
Specific Gravity	ASTM D792	1.15

SYSTEM AVAILABILITY	LAYER THICKNESS CAPABILITY	SUPPORT STRUCTURE	AVAILABLE COLORS
Fortus 450mc Stratasys F900	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.

[1] Build orientation is on side long edge.
[2] Literature value unless otherwise noted.

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HEADQUARTERS
7665 Commerce Way,
Eden Prairie, MN 55344
+1 800 801 6491 (US Toll Free)
+1 952 937 3000 (Intl)
+1 952 937 0070 (Fax)

1 Holtzman St., Science Park,
PO Box 2496
Rehovot 76124, Israel
+972 74 745 4000
+972 74 745 5000 (Fax)

Stratasys GmbH
Airport Boulevard B 120
77836 Rheinmuenster, Germany
+49 7229 7772-0
+49 7229 7772-990 (Fax)