

# FDM<sup>®</sup> Nylon 12

Production-Grade Thermoplastic for Fortus 3D Production Systems



FDM<sup>®</sup> Nylon 12 is the first material in Stratasys' new family of nylon offerings, complementing the current portfolio of FDM materials and enabling new applications requiring: repetitive snap fits, high fatigue resistance, strong chemical resistance and press (friction) fit inserts. Nylon 12 is primarily used in aerospace, automotive and consumer goods industries to take on everything from tooling, jigs and fixtures to covers, panels and vibration resistant components. For use with Fortus<sup>®</sup> 360mc, 400mc & 900mc 3D Production Systems, FDM Nylon 12 offers unparalleled toughness and a simple, clean process – free of powders.

CONDITIONED*					
Mechanical Properties <sup>1</sup>	Test Method	English		Metric	
		XZ Axis	ZX Axis	XZ Axis	ZX Axis
Tensile Strength (Type 1, 0.125", 0.2"/min)	ASTM D638	7,000 psi	6,400 psi	48 MPa	44 MPa
Tensile Modulus (Type 1, 0.125", 0.2"/min)	ASTM D638	190,000 psi	180,000 psi	1,310 MPa	1,241 MPa
Elongation at Break (Type 1, 0.125", 0.2"/min)	ASTM D638	30%	5%	30%	5%
Elongation at Yield (Type 1, 0.125", 0.2"/min)	ASTM D638	6.5%	5%	6.5%	5%
Flexural Strength (Method 1, 0.05"/min)	ASTM D790	10,000 psi	8,600 psi	69 MPa	59 MPa
Flexural Modulus (Method 1, 0.05"/min)	ASTM D790	190,000 psi	180,000 psi	1,310 MPa	1,241 MPa
Flexural Strain at Break (Method 1, 0.05"/min)	ASTM D790	No Break	>10%	No Break	>10%
IZOD impact - notched (Method A, 23°C)	ASTM D256	3.7 ft-lb/in	75.0 ft-lb/in	200 J/m	75 J/m
IZOD impact - unnotched (Method A, 23°C)	ASTM D256	>37.4 ft-lb/in	3.7 ft-lb/in	>2,000 J/m	200 J/m

UNCONDITIONED (DRY)**					
Mechanical Properties	Test Method	English		Metric	
		XZ Axis	ZX Axis	XZ Axis	ZX Axis
Tensile Strength, Yield (Type 1, 0.125", 0.2"/min)	ASTM D638	7,700 psi	6,900 psi	53 MPa	48 MPa
Tensile Modulus (Type 1, 0.125", 0.2"/min)	ASTM D638	190,000 psi	180,000 psi	1,310 MPa	1,241 MPa
Elongation at Break (Type 1, 0.125", 0.2"/min)	ASTM D638	9.5%	5%	9.5%	5%
Elongation at Yield (Type 1, 0.125", 0.2"/min)	ASTM D638	6.5%	5%	6.5%	5%
Flexural Strength (Method 1, 0.05"/min)	ASTM D790	10,200 psi	8,600 psi	0 MPa	0 MPa
Flexural Modulus (Method 1, 0.05"/min)	ASTM D790	190,000 psi	180,000 psi	0 MPa	0 MPa
Flexural Strain at Break	ASTM D790	No Break	>10%	No Break	>10%
IZOD impact - notched (Method A, 23°C)	ASTM D256	2.8 ft-lb/in	0.9 ft-lb/in	150 J/m	50 J/m
IZOD impact - unnotched (Method A, 23°C)	ASTM D256	>37.4 ft-lb/in	5.1 ft-lb/in	>2,000 J/m	275 J/m

# FDM Nylon 12



Thermal Properties <sup>1</sup>	Test Method	English	Metric
Heat Deflection (HDT) @ 66 psi annealed	ASTM D648	207°F	97°C
Heat Deflection (HDT) @ 66 psi unannealed	ASTM D649	167°F	75°C
Heat Deflection (HDT) @ 264 psi annealed	ASTM D650	180°F	82°C
Heat Deflection (HDT) @ 264 psi unannealed	ASTM D651	131°F	55°C
Melting Point	-----	352°F	178°C

Other	Test Method	Value
Specific Gravity	ASTM D792	1.00
Flame Classification	UL94	HB
UL File Number	-----	E345258

System Availability	Layer Thickness Capability	Support Material	Color
Fortus 360mc	0.013 inch (0.330 mm)	SR-110	■ Black
Fortus 400mc	0.010 inch (0.254 mm)		
Fortus 900mc	0.007 inch (0.178 mm)		

\*Conditioned = 20°C and 50% RH for 72 hours  
 \*\*Unconditioned (Dry) = Direct from FDM system  
 — Annealed = 2 hours @ 140°C  
 — Unannealed = direct from FDM system

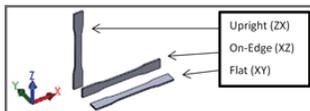
The information presented are typical values intended for reference and comparison purposes only. They should not be used for design specifications or quality control purposes. End-use material performance can be impacted (+/-) by, but not limited to, part design, end-use conditions, test conditions, etc. Actual values will vary with build conditions. Tested parts were built on Fortus 400mc @ 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 that 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>Literature value unless otherwise noted.

Orientation: See Stratasys Testing white paper for more detailed description of build orientations.

- XZ = X or "on edge"
- XY = Y or "flat"
- ZX = or "upright"



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## At the core: Advanced FDM Technology™

Fortus 3D Production Systems are powered by Stratasys FDM (Fused Deposition Modeling) Technology. FDM is the industry's leading additive manufacturing technology, and the only one that uses production-grade thermoplastics, enabling the most durable parts. Fortus systems use a wide range of thermoplastics with advanced mechanical properties so your parts can endure high heat, caustic chemicals, sterilization, and high impact applications.

## No special facilities needed

You can install a Fortus 3D Production System just about anywhere. No special venting is required because Fortus systems don't produce noxious fumes, chemicals, or waste.

## No special skills needed

Fortus 3D Production Systems are easy to operate and maintain compared to other additive fabrication systems because there are no messy powders or resins to handle and contain. They're so simple, an operator can be trained to operate a Fortus system in less than 30 minutes.

## Get your benchmark on the future of manufacturing

Fine details. Smooth surface finishes. Accuracy. Strength. The best way to see the advantages of a Fortus 3D Production System is to have your own part built on a Fortus system. Get your free part at:

[stratasys.com](http://stratasys.com).