



# ASA

## A UV-STABLE, PRODUCTION-GRADE THERMOPLASTIC FOR FORTUS® 3D PRODUCTION SYSTEMS

Now you can build consistently high-quality parts, with exceptional UV stability and the best aesthetics of any FDM® thermoplastic. ASA is poised to become the most popular all-purpose prototyping material for users of Fortus 360mc™, 380mc™, 400mc™, 450mc™ and 900mc™ 3D Production Systems. Matching or exceeding the mechanical properties of ABS, ASA may be your new favorite general prototyping material. Its UV-resistance makes it especially suited in end-use parts for outdoor commercial and infrastructure use. And its wide selection of colors and matte finish makes it ideal for attractive prototypes in consumer sporting goods, tools and automotive components and accessories.

### MECHANICAL PROPERTIES

TEST METHOD	STANDARD	ENGLISH		METRIC	
		XZ ORIENTATION	ZX ORIENTATION	XZ ORIENTATION	ZX ORIENTATION
Tensile Strength, Yield (Type 1, 0.125", 0.2"/min)	ASTM D638	4,200 psi	3,850 psi	29 MPa	27 MPa
Tensile Strength, Ultimate (Type 1, 0.125", 0.2"/min)	ASTM D638	4,750 psi	4,300 psi	33 MPa	30 MPa
Tensile Modulus (Type 1, 0.125", 0.2"/min)	ASTM D638	290,000 psi	280,000 psi	2,010 MPa	1,950 MPa
Elongation at Break (Type 1, 0.125", 0.2"/min)	ASTM D638	9%	3%	9%	3%
Elongation at Yield (Type 1, 0.125", 0.2"/min)	ASTM D638	2%	2%	2%	2%
Flexural Strength (Method 1, 0.05"/min)	ASTM D790	8,700 psi	6,900 psi	60 MPa	48 MPa
Flexural Modulus (Method 1, 0.05"/min)	ASTM D790	270,000 psi	240,000 psi	1,870 MPa	1,630 MPa
Flexural Strain at Break (Method 1, 0.05"/min)	ASTM D790	No Break	4%	No Break	4%

### THERMAL PROPERTIES<sup>2</sup>

TEST METHOD	ENGLISH	METRIC
Heat Deflection (HDT) @ 66 psi	208°F	98°C
Heat Deflection (HDT) @ 264 psi	196°F	91°C
Vicat Softening Temperature (Rate B/50)	217°F	103°C
Glass Transition Temperature (Tg)	226°F	108°C
Coefficient of Thermal Expansion (flow)	4.90E-06 in/in/°F	8.79E-06 mm/mm/°C
Coefficient of Thermal Expansion (xflow)	4.60E-06 in/in/°F	8.28E-06 mm/mm/°C

### ELECTRICAL PROPERTIES

TEST METHOD	ORIENTATION	VALUE RANGE
ASTM D257	XZ	1.0E14 - 1.0E15 ohm-cm
ASTM D150-98	XZ	2.97 - 3.04
ASTM D150-98	XZ	0.009
ASTM D149-09, Method A	XZ	329 V/mil
ASTM D149-09 Method A	ZX	414 V/mil



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### At the core:

#### Advanced FDM technology

Fortus systems are based on patented Stratasys FDM technology. FDM 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 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).

### MECHANICAL PROPERTIES

TEST METHOD	STANDARD	ENGLISH	METRIC
Notched Impact, XZ orientation (Method A, 23°C)	ASTM D256	1.2 ft-lb/in	64 J/m
Unnotched Impact, XZ orientation (Method A, 23°C)	ASTM D256	6 ft-lb/in	321 J/m

OTHER	TEST METHOD	VALUE
Specific Gravity	ASTM D792	1.05
Flame Classification	UL94	HB
Rockwell Hardness	ASTM D785	82
UL File Number	-----	345258

SYSTEM AVAILABILITY	LAYER THICKNESS CAPABILITY	SUPPORT STRUCTURE	AVAILABLE COLORS <sup>2</sup>
Fortus 360mc	0.013 inch (0.330 mm)	Soluble Support	<span style="display: inline-block; width: 10px; height: 10px; background-color: black; margin-right: 5px;"></span> Black <span style="display: inline-block; width: 10px; height: 10px; background-color: darkblue; margin-left: 20px; margin-right: 5px;"></span> Dark Blue
Fortus 380mc	0.010 inch (0.254 mm)		<span style="display: inline-block; width: 10px; height: 10px; background-color: darkgray; margin-right: 5px;"></span> Dark Gray <span style="display: inline-block; width: 10px; height: 10px; background-color: green; margin-left: 20px; margin-right: 5px;"></span> Green
Fortus 400mc	0.007 inch (0.178 mm)		<span style="display: inline-block; width: 10px; height: 10px; background-color: lightgray; margin-right: 5px;"></span> Light Gray <span style="display: inline-block; width: 10px; height: 10px; background-color: yellow; margin-left: 20px; margin-right: 5px;"></span> Yellow
Fortus 450mc	0.005 inch (0.127 mm)		<span style="display: inline-block; width: 10px; height: 10px; background-color: white; border: 1px solid black; margin-right: 5px;"></span> White <span style="display: inline-block; width: 10px; height: 10px; background-color: orange; margin-left: 20px; margin-right: 5px;"></span> Orange
Fortus 900mc <sup>3</sup>			<span style="display: inline-block; width: 10px; height: 10px; background-color: ivory; border: 1px solid black; margin-right: 5px;"></span> Ivory <span style="display: inline-block; width: 10px; height: 10px; background-color: red; margin-left: 20px; margin-right: 5px;"></span> Red

Tests were conducted according to published Stratasys FDM material testing methods, in compliance with the relevant ASTM standards.

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 at 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.

<sup>2</sup> The test data was collected using ASA (Natural) specimens. ASA colored material will have similar properties, but can vary by up to 10%.

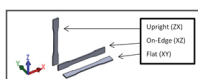
<sup>3</sup> Fortus 900mc does not have the 0.005 inch (0.127 mm) layer thickness capability.

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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