



# ASA

## A UV-STABLE, PRODUCTION-GRADE THERMOPLASTIC FOR FDM 3D PRINTERS

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 Printers, and the Stratasys F123 Series. 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            |
|---------------------|-------------|------------------------|
| Volume Resistivity  | XZ          | 1.0E14 - 1.0E15 ohm-cm |
| Dielectric Constant | XZ          | 2.97 - 3.04            |
| Dissipation Factor  | XZ          | 0.009                  |
| Dielectric Strength | XZ          | 329 V/mil              |
| Dielectric Strength | ZX          | 414 V/mil              |



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### At the core:

#### Advanced FDM technology

Fortus systems and the Stratasys F123 Series are based on patented Stratasys FDM technology. FDM uses production-grade thermoplastics, enabling the most durable parts. These 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 Printer or Stratasys F123 Series 3D Printer just about anywhere. No special venting is required because these systems don't produce noxious fumes, chemicals or waste.

#### No special skills needed

Fortus 3D Printers and Stratasys F123 Series 3D Printers 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 one 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 Printer or Stratasys F123 Series 3D Printer is to have your own part built on one. 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 (Scale R, 73°F) | 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   | ■ Black      ■ Dark Blue      |
| Fortus 380mc              | 0.010 inch (0.254 mm)      |                   | ■ Dark Gray      ■ Green      |
| Fortus 400mc              | 0.007 inch (0.178 mm)      |                   | ■ Light Gray      ■ Yellow    |
| Fortus 450mc              | 0.005 inch (0.127 mm)      |                   | □ White      ■ Orange         |
| Fortus 900mc <sup>3</sup> |                            |                   | ■ Ivory      ■ Red            |
| Stratasys F123 Series     |                            |                   |                               |

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%.

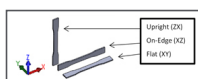
<sup>3</sup> Fortus 900mc does not have the 0.005 inch (0.127 mm) layer thickness capability.

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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