ULTEM™ 9085 resin is a flame-retardant high-performance thermoplastic for digital manufacturing and rapid prototyping. It is ideal for the transportation industry due to its high strength-to-weight ratio and its FST (flame, smoke and toxicity) rating. This unique material's certifications make it an excellent choice for the commercial transportation industry – especially aerospace, marine and ground vehicles. Combined with a Fortus® 3D Production System, ULTEM 9085 resin allows design and manufacturing engineers to produce fully functional parts that are ideal for advanced functional prototypes or end use without the cost or lead time of traditional tooling.

### Mechanical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>English</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Strength, Yield (Type 1, 0.125&quot;, 0.2&quot;/min)</td>
<td>ASTM D638</td>
<td>6,800 psi</td>
<td>47 MPa</td>
</tr>
<tr>
<td>Tensile Strength, Ultimate (Type 1, 0.125&quot;, 0.2&quot;/min)</td>
<td>ASTM D638</td>
<td>9,950 psi</td>
<td>69 MPa</td>
</tr>
<tr>
<td>Tensile Modulus (Type 1, 0.125&quot;, 0.2&quot;/min)</td>
<td>ASTM D638</td>
<td>312,000 psi</td>
<td>2,150 MPa</td>
</tr>
<tr>
<td>Tensile Elongation at Break (Type 1, 0.125&quot;, 0.2&quot;/min)</td>
<td>ASTM D638</td>
<td>5.8%</td>
<td>5.8%</td>
</tr>
<tr>
<td>Flexural Strength (Method 1, 0.05&quot;/min)</td>
<td>ASTM D790</td>
<td>16,200 psi</td>
<td>112 MPa</td>
</tr>
<tr>
<td>Flexural Modulus (Method 1, 0.05&quot;/min)</td>
<td>ASTM D790</td>
<td>331,000 psi</td>
<td>2,300 MPa</td>
</tr>
<tr>
<td>Flexural Strain at Break (Method 1, 0.05&quot;/min)</td>
<td>ASTM D790</td>
<td>No break</td>
<td>No break</td>
</tr>
<tr>
<td>IZOD Impact, notched (Method A, 23°C)</td>
<td>ASTM D256</td>
<td>2.2 ft-lb/in</td>
<td>120 J/m</td>
</tr>
<tr>
<td>IZOD Impact, un-notched (Method A, 23°C)</td>
<td>ASTM D256</td>
<td>14.6 ft-lb/in</td>
<td>781 J/m</td>
</tr>
<tr>
<td>Compressive Strength, Yield (Method 1, 0.05&quot;/min)</td>
<td>ASTM D695</td>
<td>14,500 psi</td>
<td>100 MPa</td>
</tr>
<tr>
<td>Compressive Strength, Ultimate (Method 1, 0.05&quot;/min)</td>
<td>ASTM D695</td>
<td>26,200 psi</td>
<td>181 MPa</td>
</tr>
<tr>
<td>Compressive Modulus (Method 1, 0.05&quot;/min)</td>
<td>ASTM D695</td>
<td>1,030,000 psi</td>
<td>7,012 MPa</td>
</tr>
</tbody>
</table>

### Thermal Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>English</th>
<th>Metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat Deflection (HDT) @ 264 psi, 0.125&quot; unannealed</td>
<td>ASTM D648</td>
<td>307°F</td>
<td>153°C</td>
</tr>
<tr>
<td>Glass Transition Temperature (Tg)</td>
<td>DSC (SSYS)</td>
<td>367°F</td>
<td>186°C</td>
</tr>
<tr>
<td>Coefficient of Thermal Expansion</td>
<td>ASTM E831</td>
<td>3.67x10^-4 in/(in °F)</td>
<td>65.27 µm/(m °C)</td>
</tr>
<tr>
<td>Melting Point</td>
<td>--------------</td>
<td>---------------</td>
<td>--------------</td>
</tr>
</tbody>
</table>

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ULTEM™ 9085
PRODUCTION-GRADE THERMOPLASTIC FOR FORTUS 3D PRODUCTION SYSTEMS

At the core:
Advanced FDM Technology
Fortus systems are based on 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 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.

**ELECTRICAL PROPERTIES** | **TEST METHOD** | **VALUE RANGE**
--- | --- | ---
Volume Resistivity | ASTM D257 | 4.9 x 10^15 - 8.2 x 10^15 ohm-cm
Dielectric Constant | ASTM D150-98 | 3 - 3.2
Dissipation Factor | ASTM D150-98 | 0.0026 - 0.0027
Dielectric Strength | ASTM D149-09, Method A | 110 - 290 V/mil

**OTHER**

| **TEST METHOD** | **VALUE** |
--- | --- |
Specific Gravity | ASTM D792 | 1.34
Rockwell Hardness | ASTM D785 | ---
Flame Classification | UL94 | V-0 (1.5 mm, 3 mm)
Oxygen Index | ASTM D2863 | 0.49
OSU Total Heat Release (2 min test, .060” thick) | FAR 25.853 | 16 kW min/m²
UL File Number | ----------- | E345258
Outgassing
Total Mass Loss (TML) | ASTM E595 | 0.41% (1.00% maximum)
Collected Volatile Condensable Material (CVCM) | ASTM E595 | -0.1% (0.10% maximum)
Water Vapor Recovered (WVR) | ASTM E595 | -0.37% (report)
Fungus Resistance (Method 508.6) | MIL-STD-810G | Passed

**Burn Testing**
Horizontal Burn (15 sec) | 14 CFR/FAR 25.853 | Passed (0.060” thick)
Vertical Burn (60 sec) | 14 CFR/FAR 25.853 | Passed (0.060” thick)
Vertical Burn (12 sec) | 14 CFR/FAR 25.853 | Passed (0.060” thick)
45° Ignition | 14 CFR/FAR 25.853 | Passed (0.060” thick)

**NBS Smoke Density (flaming)** | **ASTM F814/E662** | **Passed (0.060” thick)**
**NBS Smoke Density (non-flaming)** | **ASTM F814/E662** | **Passed (0.060” thick)**

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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.

The information presented in this document 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, color, 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.

1Build orientation is on side long edge.
2Literature value unless otherwise noted.
3Due to amorphous nature, material does not display a melting point.
4All Electrical Property values were generated from the average of test plaques built with default part density (solid). Test plaques were 4.0 x 4.0 x 0.1 inches (102 x 102 x 2.5 mm) and were built both in the flat and vertical orientation. The range of values is mostly the result of the difference in properties of test plaques built in the flat vs. vertical orientation.

<table>
<thead>
<tr>
<th>SYSTEM AVAILABILITY</th>
<th>LAYER THICKNESS CAPABILITY</th>
<th>SUPPORT STRUCTURE</th>
<th>AVAILABLE COLORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fortus 400mc™</td>
<td>0.013 inch (0.330 mm)</td>
<td>Breakaway</td>
<td>Tan (Natural)</td>
</tr>
<tr>
<td>Fortus 450mc™</td>
<td>0.010 inch (0.254 mm)</td>
<td></td>
<td>Black</td>
</tr>
<tr>
<td>Fortus 900mc™</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

XZ = X or “on edge”
XY = Y or “flat”
ZX = or “upright”
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