

ULTEM* 9085

ULTEM* 9085 is a flame retardant high performance thermoplastic for direct 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 preexisting 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 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 ¹ | Test Method | English | Metric |
|---|-------------|-----------------|-----------|
| Tensile Strength (Type 1, 0.125", 0.2"/min) | ASTM D638 | 10,400 psi | 71.6 MPa |
| Tensile Modulus (Type 1, 0.125", 0.2"/min) | ASTM D638 | 322 kpsi | 2,200 MPa |
| Tensile Elongation (Type 1, 0.125", 0.2"/min) | ASTM D638 | 6% | 6% |
| Flexural Strength (Method 1, 0.05"/min) | ASTM D790 | 16,700 psi | 115.1 MPa |
| Flexural Modulus (Method 1, 0.05"/min) | ASTM D790 | 362.6 kpsi | 2,500 MPa |
| IZOD Impact, notched (Method A, 23°C) | ASTM D256 | 2.0 ft-lb f/in | 106 J/m |
| IZOD Impact, un-notched (Method A, 23°C) | ASTM D256 | 11.5 ft-lb f/in | 613.8 J/m |
| Compression Strength | ASTM D695 | 15.2 ksi | 104 MPa |
| Compression Modulus | ASTM D732 | 280 ksi | 1930 MPa |
| Shear Strength (0.25" thick coupon) | ASTM D732 | 8.3 ksi | 57 MPa |

| Thermal Properties ² | Test Method | English | Metric |
|--|-------------|-----------------------------|-----------------------------|
| Heat Deflection (HDT) @ 66 psi, 0.125" unannealed | ----- | ----- | ----- |
| Heat Deflection (HDT) @ 264 psi, 0.125" unannealed | ASTM D648 | 307 °F | 153°C |
| Glass Transition Temperature (Tg) | DSC (SSYS) | 367°F | 186°C |
| Coefficient of Thermal Expansion | ASTM E228 | 3.67e-05 in/(in·F°) | 65.27 µm/(m·C°) |
| Melt Point | ----- | Not Applicable ³ | Not Applicable ³ |

| Electrical Properties ⁴ | Test Method | Value Range |
|------------------------------------|------------------------|--------------------------------|
| Volume Resistivity | ASTM D257 | 1.0 x 10e14 - 6.0 x 10e13 ohms |
| Dielectric Constant | ASTM D150-98 | 3.2 - 3.0 |
| Dissipation Factor | ASTM D150-98 | .0027 - .0026 |
| Dielectric Strength | ASTM D149-09, Method A | 290 - 110 V/mil |



| Other ² | Test Method | Value |
|--|---|-----------------------------------|
| Specific Gravity | ASTM D792 | 1.34 |
| Rockwell Hardness | ASTM D785 | --- |
| Flame Classification | UL94 | V-0 |
| Oxygen Index | ASTM D2863 | 0.49 |
| Vertical Burn | FAR 25.853 (Test a (60s), passes at) | 2 seconds |
| FAA Flammability | FAR 25.853 (Method A/B) | < 5 |
| OSU Total Heat Release (5 min test) | FAR 25.853 | 36 kW/m ² |
| OSU Total Heat Release (2 min test) | FAR 25.853 | 16 kW min/m ² |
| UL File Number | ----- | E345258 |
| Outgassing | | |
| Total Mass Loss (TML) | ASTM E595 | 0.41% (1.00% maximum) |
| Collected Volatile Condensable Material (CVCN) | 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 | | |
| Vertical Burn (60 sec) | FAR 25.853 | Passed (0.040" - 0.250" thick) |
| Heat Release 65/65 | FAR 25.853 | Passed (<40HR Peak, 0.060" thick) |
| NBS Smoke Density (flaming) | ASTM F814/E662 | Passed |
| NBS Smoke Density (non-flaming) | ASTM F814/E662 | Passed |

| System Availability | Layer Thickness Capability | Support Structure | Available Colors |
|------------------------------|---|-------------------|------------------|
| Fortus 400mc Fortus 900mc | 0.013 inch (0.330 mm) ⁵ 0.010 inch (0.254 mm) | BASS | ■ Tan ■ Black |

The performance characteristics of these materials may vary according to application, operating conditions, or end use. Each user is responsible for determining that the Stratasy's 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. Stratasy's 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.

⁵0.013 inch (0.300 mm) layer thickness not available for Fortus 400mc

For more information about Fortus systems, materials and applications, call **888.480.3548** or visit www.fortus.com

**Fortus 3D Production Systems
Stratasy's Incorporated**
7665 Commerce Way
Eden Prairie, MN 55344
+1 888 480 3548 (US Toll Free)
+1 952 937 3000
+1 952 937 0070 (Fax)
info@stratasy's.com

**Fortus 3D Production Systems
Stratasy's GmbH**
Weismüllerstrasse 27
60314 Frankfurt am Main
Germany
+49 69 420 994 30 (Tel)
+49 69 420 994 333 (Fax)
europe@stratasy's.com

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At the core: Advanced FDM Technology™

Fortus systems are based on patented Stratasy's 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: www.fortus.com/benchmark.