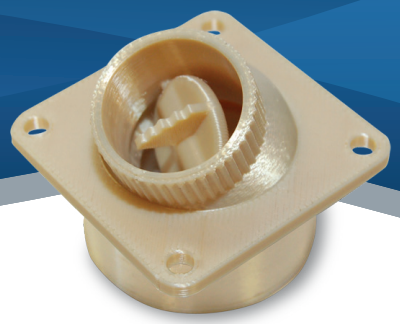
ULTEM™ 9085

Production-Grade Thermoplastic for Fortus 3D Production Systems



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	4.9e15 - 8.2e15 ohms-cm
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

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ULTEM™ 9085

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/m²
OSU Total Heat Release (2 min test)	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		
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	0.013 inch (0.330 mm)[5]	BASS	Tan
Fortus 900mc	0.010 inch (0.254 mm)		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 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.

[1]*Build orientation is on side long edge.*

[2]*Literature value unless otherwise noted.*

[3]*Due to amorphous nature, material does not display a melting point.*

[4]*All 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.*

[5]*0.013 inch (0.300 mm) layer thickness not available for Fortus 400mc*

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At the core: Advanced FDM Technology™

Fortus systems are based on patented 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.

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