

ULTEM 9085

APPLICATIONS

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. 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	ASTM E228	Expansion 3.67e-05 in/(in·F°)	65.27 µm/(m·C°)
Melt Point	-----	Not Applicable ³	Not Applicable ³

Electrical Properties ²	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 (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

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).