



# ULTEM®

(polyetherimide)

ULTEM is an amorphous thermoplastic polyetherimide (PIE) material which combines exceptional mechanical, thermal, and electrical properties. Natural ULTEM®

1000 (unreinforced) is a translucent amber material. The addition of glass fiber reinforcement to the basic ULTEM®, coupled with Ensinger's proprietary extrusion techniques,

provides the ULTEM® with both greater tensile strength and rigidity while at the same time improving dimensional stability.

Plastic & Metal Center, Inc.  
23162 La Cadena Drive  
Laguna Hills, CA 92653  
Tel: 949-770-8230  
[www.plastic-metal.com](http://www.plastic-metal.com)

- **Excellent mechanical strength**  
ULTEM® exhibits high tensile strength at room temperature and retains a significant portion of this strength at elevated temperatures. Glass fibers further increase high-temperature strength.
- **Outstanding heat resistance**  
ULTEM® retains its physical properties at elevated temperatures.
- **Exceptional resistance to environmental forces**  
Environmental characteristics of ULTEM® include its stress resistance
- **Inherent flame resistance with low smoke evolution**
- **High mechanical strength**
- **High dielectric strength and stability**  
The high dielectric strength and constant values of ULTEM® make it an excellent electrical insulator UL 94 V.0
- **Low dissipation factor over a wide range of frequencies**
- **Excellent machinability and finishing characteristics**  
ULTEM® can be easily machined with conventional metalworking tools, painted, hot stamped, printed, or metallized.
- **Natural Grade is FDS, NSF, and USP Class VI compliant**

*ULTEM® has many applications in medical, electronic/electrical, microwave, automotive, and aircraft industries.*

# TYPICAL PROPERTY VALUES

PROPERTIES	ASTM Test Method	Units	ULTEM®	ULTEM® 10% Glass Reinforced	ULTEM® 20% Glass Reinforced	ULTEM® 30% Glass Reinforced	
<b>PHYSICAL</b>	Specific Gravity	D792	-	1.27	1.34	1.42	1.51
	Water Absorption, @24 hours, 73°F (23C)	D570	%	-	-	-	-
	@Equilibrium, 73°F (23C)			0.25	0.21	0.19	0.16
				1.25	1.20	1.10	0.90
<b>MECHANICAL</b>	Tensile Strength, Break, 73°F	D638	psi	15,200	16,600	20,100	24,500
	Tensile Modulus, 73°F	D638	psi	430,000	650,000	1,000,000	1,300,000
	Elongation, Break, 73°F	D638	%	60	6	3	13
	Elongation, Yield, 73°F	D638	%	7-8	5	N/A	N/A
	Flexural Strength, 73°F	D790	psi	22,000	28,000	30,000	33,000
	Flexural Modulus, 73°F	D790	psi	480,000	650,000	900,000	1,300,000
	Izod Impact Strength, Notched, 73°F	D256	ft-lbs/in	1.0	1.1	1.6	1.6
	Rockwell Hardness	D785	"M" Scale	109	114	114	114
	Compressive Strength	D695	psi	21,900	22,000	28,700	30,700
	Compressive Modulus	D695	psi	480,000	541,000	809,000	938,000
	Shear Strength, Ultimate	-	psi	15,000	13,000	13,500	14,000
	<b>THERMAL</b>	Deflection Temperature	D648	°F	-	-	-
@ 66 psi, 1/4"		-	-	410	410	410	414
@264 psi, 1/4"		-	-	392	405	408	410
Coefficient of Thermal Expansion		D696	in/in-°F	3.1 x 10 <sup>-5</sup>	1.8 x 10 <sup>-5</sup>	1.4 x 10 <sup>-5</sup>	1.1 x 10 <sup>-5</sup>
Melting Point		-	°F	426	-	-	-
Thermal Conductivity		D2214	BTU-in/hr-ft <sup>2</sup> -°F	0.85	1.22	1.43	1.56
Flammability	UL94	-	V-0	V-0	V-0	V-0	
<b>ELECTRICAL</b>	Dielectric Strength, In Oil	D149	V/mil	710	700	670	630
	In Air	-	-	830	-	-	770
	Dielectric Constant,	D150	-	-	-	-	-
	1kHz, 50% RH	-	-	3.15	3.5	3.5	3.7
	Dissipation Factor	D150	-	-	-	-	-
	1kHz, 50% RH, 73°F (23°C)	-	-	0.0013	0.0014	0.0015	0.0015
Volume Resistivity, 1/16"	D257	ohm-cm	1.0 x 10 <sup>17</sup>	1.0 x 10 <sup>17</sup>	7.0 x 10 <sup>16</sup>	3.0 x 10 <sup>16</sup>	

This information is only to assist and advise you on current technical knowledge and is given without obligation or liability. All trade and patent rights should be observed. All rights reserved. Data obtained from extruded shapes material.

## MATERIAL AVAILABILITY

**Rods:** Diameters: 1/4" to 8"  
Length: 10'

**Plates:** 1/4" to 2" thickness inclusive are 2' x 4'  
2 1/4" to 4" thickness inclusive are 1' x 4'

## Primary Specification (Resin) (Typical)

ASTM-D-4066 PA0110L2A00000

## Shapes Specification (Typical)

ASTM-D-5989 S-PA0121

**Profiles, tubes, and special sizes are custom-produced on request.**



**ENSINGER-HYDE**

ASK. THINK. SUCCEED.



Division of Ensinger, Inc.

HEADQUARTERS  
365 Meadowlands Boulevard  
Washington, Pennsylvania 15301  
**Telephone:** 800-243-3221 Sales  
800-869-4029 Technical  
**Fax:** 724-746-9209

e-mail: sales@ensinger-ind.com

CANADA  
Ensinger-Plastifab  
8115 Lafrenaye Street  
Montreal, Quebec H1P 2B1  
**Telephone:** 514-325-9840  
**Fax:** 514-325-5222

Web site: www.plastifab.ca  
E-mail: infoprod@plastifab.ca

DISTRIBUTED BY

Plastic & Metal Center, Inc.  
23162 La Cadena Drive  
Laguna Hills, CA 92653  
Tel: 949-770-8230  
www.plastic-metal.com