

HIGH PERFORMANCE

ULTEM - RADEL- POLYCARBONATE

			Udel	Utem 1000	Utem 1000	Utem 2300	Utem 2300	Semitron ESD410	Radel A	Radel R R-5500	Hydex 202	Hydex 301 Clear	Hyzod M Poly-carbonate	Glass Filled Poly-carbonate		
	Units	ASTM Test Method	Extruded Polysulfone	Extruded Polyetherimide	Injection molded Polyetherimide	Extruded 30% Glass Filled Polyetherimide	Injection Molded 30% GF Polyetherimide	Static Dissapative Polyetherimide	Extruded Polyether-Sulfone	Extruded Polyphenyl-Sulfone	Extruded Rigid Poly-Urethane	Extruded Rigid Poly-Urethane	Extruded Polycarbonate	Extruded 20% Glass Filled Polycarbonate		
MECHANICAL	1	Strength to Weight Ratio	ksi	8.2	12.9	12.0	11.3	16.2	6.4	8.9	8.5	8.3	8.3	8.8	11.9	
	2	Specific Gravity @ 73 F	-	1.24	1.28	1.27	1.51	1.51	1.41	1.37	1.29	1.20	1.20	1.20	1.35	
	3	Tensile Strength @73 F, (ult/yld)	psi	D638	10200 (ult)	16500 (ult)	15200 (yld)	17000 (ult)	24500 (yld)	9000	12200 (yld)	11000 (ult)	10000 (yld)	10500 (ult)	16000 (yld)	
	4	Tensile Modulus of Elasticity @ 73 F	psi	D638	390000	500000	-	800000	1260000	850000	385000	340000	260000	310000	320000	860000
	5	Tensile Elongation at Break @ 73 F	%	D638	30	80	7	3	3	2	40-80	30	90	140	100	6
	6	Flexural Strength @73 F	psi	D790	15000	20000	22000	30000	33000	12000	18700	15500	13000	14000	13000	19000
	7	Flexural Modulus of Elasticity @ 73 F	psi	D790	400000	500000	480000	900000	1300000	850000	377000	345000	280000	340000	350000	800000
	8	Shear Strength @ 73 F	psi	D732	9000	15000	15000	-	14000	-	-	9000	-	-	9200	-
	9	Compressive Strength, (%Deformation) @ 73 F	psi	D695	13000 (10)	22000 (10)	21900 (10)	32000 (10)	30700 (10)	19500 (10)	-	13400 (10)	-	12000 (10)	11500 (10)	16000 (10)
	10	Compressive Modulus of Elasticity @ 73 F	psi	D695	375000	480000	480000	625000	938000	600000	-	280000	-	-	300000	-
	11	Hardness, Rockwell, Scale as noted @ 73 F	-	D785	M82 (R128)	M112 (R125)	M109	M114 (R127)	M114	M115 (R125)	M88	M80 (R120)	(R123)	M74 (R123)	M75 (R126)	M91 (R122)
	12	Hardness, Durometer, Shore D @ 73 F	-	D2240	D80	D86	-	D86	-	D85	-	D80	-	-	D80	-
	13	Izod Impact, (Notched) @ 73 F	ft-lb/in of notch	D256 TypeA	1.3	0.5	1.0	1.0	2.0	0.8	1.6	2.5	10.0	2.4	1.5	2.0
	14	Coefficient of Friction, (Dry vs. Steel) Dynamic	-	-	-	0.42	-	-	-	0.18	-	-	-	-	-	0.22
	15	Limiting PV, with 4 to 1 factor of safety applied	psi-ft/min	-	-	1875	-	-	-	12000	-	-	-	-	-	-
THERMAL	16	Coefficient of Linear Thermal Expansion @ 73 F	in/in/F	E-831 (TMA)	3.1E-05	3.1E-05	3.1E-05	1.1E-05	1.1E-05	1.8E-05	2.7E-05	3.1E-05	3.7E-05	3.2E-05	3.9E-05	1.5E-05
	17	Heat Deflection Temperature @ 264 psi	F	D648	340	392	392	410	410	410	397	405	280	210	290	295
	18	Tg-Glass transition temperature, (Amorphous)	F	D3418	374	419	-	419	-	428	-	428	-	-	293	-
	19	Melting Point, (VS= Vicat Softening Temp.)	F	D3418	-	-	-	-	442 (VS)	-	439 (VS)	-	292 (VS)	228 (VS)	N/A	330
	20	Continuous Service Temperature in Air, (Max.)	F	-	300	340	340	340	340	338	356	300	275	200	250	266
21	Thermal Conductivity	BTU-in/hr-ft ² F	-	-	0.90	.22 W/M-C	1.15	-	-	-	2.40	-	-	1.30	1.47	
ELECTRICAL	22	Dielectric Strength, Short Term	Volts/ mil	D149	425	830	830	770	-	383	360	570	635	400	490	
	23	Volume Resistivity	ohm-cm	D257	>E13	>E13	1.0E+17	>E13	3.0E+16	1E5-1E7	1.0E+17	>E13	4.6E+15	1.5E+16	2.0E+16	1.0E+17
	24	Dielectric Constant @ 10E6Hz	-	D150	3.1	3.2	-	3.7	-	-	-	3.4	3.4	3.4	3.2	3.13
	25	Dissipation Factor @ 10E6Hz	-	D150	0.001	0.001	-	0.002	-	-	-	0.002	.025 (60Hz)	.025 (60Hz)	0.001	.0009 (60Hz)
	26	Flammability @ 3.1 mm unless noted	-	UL94	HB	V-0	5VA (1.9mm)	V-0	V-0 (.25mm)	V-0	V-0 (.5mm)	V-0	HB	HB (6.1mm)	V-2	V-0
H2O	27	Water Absorbtion, Immersion, 24 Hrs.	% by wt	D570(7)	0.30	0.25	0.25	0.18	0.16	0.30	0.54	0.37	0.15	0.14	0.20	0.16
	28	Water Absorbtion, Saturation	% by wt	D570(7)	0.60	1.25	1.25	0.90	0.90	1.25	-	1.10	1.40	1.40	0.40	0.29