

Medical Sector Bio Materials

				Radel R R-5500	UHMW-PE	50% Woven Carbon Fiber PEEK	60% Woven Carbon Fiber PEKK	Victrex PEEK 450CA30	Virgin Teflon	Tecappo MT	Ultem 1000	Victrex PEEK 450G	Invibo PEEK Optima	
		Units	ASTM Test Method	Extruded Polyphenyl- Sulfone				30% Carbon Fiber PEEK	Polytetrafluoro- ethylene		Polyetherimide	Poly- etheretherketone		
MECHANICAL	1	Strength to Weight Ratio	ksi	-	-	-	-	24	-	-	12.9	10.9	-	
	2	Specific Gravity @ 73 F	-	D792	1.29	0.93	-	1.41	2.16	-	1.28	1.30	-	
	3	Tensile Strength @ 73 F, (ult)/(yld)	psi	D638	11000 (ult)	5800	91000	105705	33785 (ult)	4500 (ult)	5076	16500 (ult)	14100 (ult)	100000
	4	Tensile Modulus of Elasticity @ 73 F	psi	D638	340000	100000	8700000	7830000	1885000	-	-	475000	522000	-
	5	Tensile Elongation at Break @ 73 F	%	D638	30	300	1	-	2	400	12	80	5	40
	6	Flexural Strength @ 73 F	psi	D790	15500	3500	120000	116580	51475	-	210000	20000	24650	24656
	7	Flexural Modulus of Elasticity @ 73 F	psi	D790	345000	110000	700000	591600	2929000	50000-90000	-	500000	594500	-
	8	Shear Strength @ 73 F	psi	D732	9000	4800	-	-	14065 (ult)	-	-	15000	7685 (ult)	-
	9	Compressive Strength, (% Deformation) @73 F	psi	D695	13400 (10)	3000	83000	75690	34800 (10)	600 (1)	-	22000 (10)	17255 (10)	19580
	10	Compressive Modulus of Elasticity @73 F	psi	D695	280000	80000	800000	764100	-	-	-	480000	-	-
	11	Hardness, Rockwell, Scale as noted @73 F	-	D785	M80 (R120)	R56	-	-	M107(R124)	-	R100	M112 (R125)	M99(R126)	M99(R126)
	12	Hardness, Durometer, Shore D @73 F	-	D2240	D80	D66	-	-	-	D55	-	D86	-	-
	13	Izod Impact, (Notched) @73 F	ft-lb/in of notch	D256 TypeA	2.5	-	-	-	1.6	3.0	0.9	0.5	1.6	7.5
	14	Coefficient of Friction, (Dry vs. Steel) Dynamic	-	-	-	0.12	-	-	-	.05-.08	-	0.42	-	-
	15	Limiting PV, (with 4 to 1 factor of safety applied)	psi-ft/min	-	-	2000	-	-	-	-	-	1875	-	-
THERMAL	16	Coefficient of Linear Thermal Expansion @73 F	in/in/F	E-831 (TMA)	3.1E-05	1.1E-05	-	-	8.0E-06	7.0E-05	-	3.1E-05	2.6E-05	4.7E-05
	17	Heat Deflection Temperature @ 264 psi	F	D648	405	116	-	-	600	115	187	392	306	-
	18	Tg-Glass transition temperature, (Amorphous)	F	D3418	428	-	-	-	289	-	-	419	289	-
	19	Melting Point, (VS=Vicat Softening Temp.)	F	D3418	-	275	-	-	644	621	325	-	644	644
	20	Continuous Service Temperature in Air, (Max.)	F	-	300	180	-	-	480	500	-	340	480	-
21	Thermal Conductivity	BTU-in/hr-ft ² -F	-	2.40	2.84	-	-	6.37	1.70	-	0.90	1.75	-	
ELECTRICAL	22	Dielectric Strength, Short Term	Volts/mil	D149	360	2300	-	-	-	600	-	830	480	
	23	Volume Resistivity	ohm-cm	D257	>1E15	-	-	-	1.4E+05	>10E+18	-	6.7E+17	4.9E+16	
	24	Dielectric Constant @ 10E6 Hz	-	D150	3.4	2.3	-	-	-	-	-	3.2	3.3	
	25	Dissipation Factor @ 10E6 Hz	-	D150	0.002	-	-	-	-	-	-	0.001	0.003	
26	Flammability @ 3.1 mm unless noted	-	UL94	V-O	HB	-	-	V-O	V-O	-	V-O	V-O		
H ₂ O	27	Water Absorbtion, Immersion, 24 Hrs	% by wt.	D570(7)	0.37	0.01	0.05	-	0.06	0.00	-	0.25	0.50	0.50
	28	Water Absorbtion, Saturation	% by wt.	D570(7)	1.10	0.01	-	-	-	-	-	1.25	0.50	