



Comparative Materials

	Property	Units	Test Method ASTM	ABS	Acetal Chemically Lubricated	Acetal Internally Lubricated	Acetal Natural	Acetal Teflon Filled	Copolymer Acetal	
				Cyclocac GSE	Delrin 500 CL	Turcite X	Delrin 150 Homo polymer	Delrin AF	Acetron GP	
Mechanical	1	Tensile Strength (73°F)	PSI	D638	6,500	9,500	5,900	11,000	8,000	9,500
	2	Flexural Strength (73°F)	PSI	D790	11,000	13,000	8,000	13,800	12,000	12,000
	3	Compressive Strength (10% Deflection)	PSI	D695	6,750	15,500	12,000	16,000	16,000	15,000
	4	Shear Strength (73°F)	PSI	D732	-	9,500	-	9,000	7,600	8,000
	5	Impact Strength, Notched Izod (73°F)	Ft-lb/in	D256	-	1.4	0.54	1.0	0.07	1.0
	6	Elongation at Break (73°F)	%	D638	20	40	19	30	15	30
	7	Tensile Modulus of Elasticity (73°F)	PSI	D638	320,000	450,000	-	450,000	435,000	400,000
	8	Flexural Modulus of Elasticity (73°F)	PSI	D790	330,000	400,000	335,000	450,000	445,000	400,000
	9	Hardness - Rockwell & Burnell (73°F)	Various Scales	D785	R105	R120	M63	R122	R115	R120
	10	Density	Lbs/in ³	-	0.037	0.053	0.054	0.051	0.055	
Wear	11	Coefficient of Friction (Dynamic)	None	-	-	0.12	0.22	0.25	0.19	0.25
	12	Wear Factor (K) +	$\frac{\text{in.}^3 \cdot \text{min}}{\text{Ft-lb-Hr}}$	-	-	22	34	200	60	200
	13	Limiting PV	PSI. FPM	-	-	12,000	16,000	2700	8,300	2,700
	14	Abrasion resistance Index	None	-	-	-	-	137	-	
Thermal	15	Continuous Service Temp - in Air (max)	°F	-	185	180	180	180	180	180
	16	Deflection Temperature (264PSI)	°F	D648	220	257	203	250	244	220
	17	Melting Point	°F	D789	-	347	345	347	347	335
	18	Deformation Under Load (2000PSI. 122°F)	%	D621	-	0.7	-	0.6	0.6	-
	19	Coefficient of Linear Thermal Expansion	in/in°F	D696	4.1x10 ⁻⁵	6.8x 10 ⁻⁵	5.2x10 ⁻⁵	4.7x10 ⁻⁵	5.0x10 ⁻⁵	5.4x10 ⁻⁵
Electrical	20	Dielectric Strength	Volts/Mil	D149	450	400	-	450	400	420
	21	Volume Resistivity	Ohm-CM	D257	1.0x10 ¹⁵	5x10 ¹⁴	-	1x10 ¹⁴	3x10 ¹⁶	>10 ¹³
	22	Dielectric Constant (60 Hz)	(60 Hz)	None	D150	3.5	-	3.7	3.7	3.8
	23	Dielectric Constant (1 KHz)	(1 KHz)	None	D150	3.5	-	-	3.73.1	3.8
Water Absorption	24	Dielectric Constant (1 MHz)	(1 MHz)	None	D150	-	-	-	3.73.1	-
	25	Water Absorption (24 Hours)	%	D570	0.30	0.27	0.20	0.20	0.20	0.20
Optical	26	Water Absorption (Saturation)	%	D570	0.70	1.00	-	0.90	1.0	0.90
	27	Light Transmittance	None	D1003	NA	NA	NA	NA	NA	
	28	Refractive Index	%	D542	NA	NA	NA	NA	NA	
	29	Haze (Initial)	%	D1003	NA	NA	NA	NA	NA	
	30	Haze (24 days, 104°F)	%	D1003	-NA	NA	NA	NA	NA	

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Comparative Materials

Property		Units	Acrylic Abrasion Resistant	AcyliteGP Acrylic Cellcast	Acrylic Extruded	Acrylic Cont. Cast	Acrylic Impact Resistant	Aluminum	Bronze Cast	CAB
			Lucite SAR	Chemcast Polycast	Lucite CP Optix	Lucite L	Duraplex	6061- 0	660	Vuex
Mechanical	1 Tensile Strength (73°F)	PSI	10,500	9,000	10,800	10,800	8,400	18,000	-	5,000
	2 Flexural Strength (73°F)	PSI	16,000	14,000	17,100	14,900	13,300	-	-	6,500
	3 Compressive Strength (10% Deflection)	PSI	-	16,000	-	17,900	14,600	-	-	4,500
	4 Shear Strength (73°F)	PSI	-	9,000	-	8,900	-	12,00	-	-
	5 Impact Strength, Notched Izod (73°F)	Ft-lb/in	0.3	0.4	0.2	-	0.62	-	-	-
	6 Elongation at Break (73°F)	%	-	2	5	4.5	-	30	-	80
	7 Tensile Modulus of Elasticity (73°F)	PSI	-	425,000	600,000	-	360,000	-	-	225,000
	8 Flexural Modulus of Elasticity (73°F)	PSI	45,000	425,000	430,000	427,000	435,000	-	-	145,000
	9 Hardness - Rockwell & Burnell (73°F)	Various Scales	M103	M90	M100	M100	M73	B30	-	R106
	10 Density	Lbs/in ³	0.044	0.044	0.044	0.44	0.044	0.098	0.381	0.043
Wear	11 Coefficient of Friction (Dynamic)	None	-	-	-	-	-	-	-	-
	12 Wear Factor (K) +	in ³ - min Ft-lb-Hr	-	-	-	-	-	-	-	-
	13 Limiting PV	PSI. FPM	-	-	-	-	-	-	75,000	-
	14 Abrasion resistance Index	None	-	-	-	-	-	-	409	-
Thermal	15 Continuous Service Temp - in Air (max)	°F	150	190	180	180	180	-	-	180
	16 Deflection Temperature (264PSI)	°F	225	80	194	203	192	-	-	-
	17 Melting Point	°F	-	-	-	-	-	-	-	-
	18 Deformation Under Load (2000PSI. 122°F)	%	-	-	-	-	-	-	-	-
	19 Coefficient of Linear Thermal Expansion	in/in°F	4x10 ⁻⁵	4.5x10 ⁻⁵	6.0x 10 ⁻⁵	3.9x 10 ⁻⁵	3.6x10	1.24x10 ⁻⁵	1.0x10 ⁻⁵	14x10 ⁻⁶
Electrical	20 Dielectric Strength	Volts/Mil	-	400	400	420	-	-	-	325
	21 Volume Resistivity	Ohm-CM	-	1x10 ¹⁵	-	1x10 ¹⁵	-	-	-	1x10 ¹¹
	22 Dielectric Constant	(60 Hz)	None	3.5	4.0	4.0	3.0	-	-	4.95
	23	(1 KHz)	None	3.2	3.5	3.0	3.0	-	-	-
24	(1 MHz)	None	2.7	3.0	3.0	3.0	-	-	-	
Water Absorption	25 Water Absorption (24 Hours)	%	0.3	0.3	0.3	0.3	0.3	-	-	1.55
	26 Water Absorption (Saturation)	%	-	1.1	-	-	-	-	-	9.0
Optical	27 Light Transmittance	N/A	93	92	92	92	92	-	-	-
	28 Refractive Index	%	-	1.49	1.49	1.49	1.49	-	-	-
	29 Haze (Initial)	%	0.5	0.5	0.5	1.0	1.2	-	-	-
	30 Haze (24 days, 104°F)	%	-	-	-	1.0	3.1	-	-	-



Property		Units	Carbon Steel	CPVC	ECTFE Fluoro-polymers	Epoxy Glass Grade G-10	FEP Fluoro carbon	HD-PE High Density Poly-ethylene
			M-1020	Corzan	Halar	Micarta H-22033S	Telfon FEP 100	Hitec
Mechanical	1 Tensile Strength (73°F)	PSI	55,000	8,200	6,960	50,000	3,400	4,600
	2 Flexural Strength (73°F)	PSI	-	15,000	-	70,000	-	1,400
	3 Compressive Strength (10% Deflection)	PSI	-	11,400	-	60,000	3,100	4,570
	4 Shear Strength (73°F)	PSI	-	9,220	-	-	-	3,380
	5 Impact Strength, Notched Izod (73°F)	Ft-lb/in	-	1.6	-	12.0	no break	3.0
	6 Elongation at Break (73°F)	%	25	1	300	-	325	55
	7 Tensile Modulus of Elasticity (73°F)	PSI	-	430,000	240,000	-	-	170,000
	8 Flexural Modulus of Elasticity (73°F)	PSI	-	410,000	261,000	-	90,000	200,000
	9 Hardness - Rockwell & Burnell (73°F)	Various Scales	B111	R121	D75	M115	D56	D69
	10 Density	Lbs/in ³	0.283	0.055	0.063	0.069	0.080	0.034
Wear	11 Coefficient of Friction (Dynamic)	None	0.25	-	-	-	-	-
	12 Wear Factor (K) +	in ³ - min Ft-lb-Hr	-	-	-	-	-	-
	13 Limiting PV	PSI. FPM	-	-	-	-	-	-
	14 Abrasion resistance Index	None	100	-	-	-	-	30
Thermal	15 Continuous Service Temp - in Air (max)	°F	-	200	-	302	400	180
	16 Deflection Temperature (264PSI)	°F	-	212	240	-	-	151
	17 Melting Point	°F	-	-	464	-	510	-
	18 Deformation Under Load (2000PSI. 122°F)	%	-	-	-	-	-	-
	19 Coefficient of Linear Thermal Expansion	in/in°F	6.33x10 ⁻⁵	3.7x10 ⁻⁵	-	-	7.5x10 ⁻⁵	1.25x10 ⁻⁴
Electrical	20 Dielectric Strength	Volts/Mil	-	1,250	-	550	2,000	500
	21 Volume Resistivity	Ohm-CM	-	3.4x10 ¹⁵	6x10 ⁻⁶	1x10 ¹⁷	1x10 ¹⁵	1x10 ¹³
	22 Dielectric Constant (60 Hz)		-	3.70	-	-	-	2.65
	23 Dielectric Constant (1 KHz)		-	3.24	-	-	-	-
Water Absorption	24 Dielectric Constant (1 MHz)		-	-	-	5.0	2.02	-
	25 Water Absorption (24 Hours)	%	-	0.04	-	0.05	0.004	0.03
Optical	26 Water Absorption (Saturation)	%	-	-	-	-	-	-
	27 Light Transmittance	None	N/A	N/A	N/A	N/A	N/A	N/A
	28 Refractive Index	%	N/A	N/A	N/A	N/A	N/A	N/A
	29 Haze (Initial)	%	N/A	N/A	N/A	N/A	N/A	N/A
	30 Haze (24 days, 104°F)	%	N/A	N/A	N/A	N/A	N/A	N/A



Property		Units	LD-PE Low Density Poly- ethylene	Nylon General Purpose	Nylatron GS	Nylon Kevlar Reinforced	Nylon Oil Impregnated	Nylon Solid Impregnated
				Zytel Nylon 101 Sustamid		Hydlar Z	Nyloil	Nylatron NSM
Mechanical	1 Tensile Strength (73°F)	PSI	1,800-2,200	11,500	12,500	17,300	9.5-11,000	11,000
	2 Flexural Strength (73°F)	PSI	1,300	15,000	17,000	21,300	14-16,000	16,000
	3 Compressive Strength (10% Deflection)	PSI	-	12,500	16,000	19,300	12-14,000	14,000
	4 Shear Strength (73°F)	PSI	2,440	10,000	10,500	-	8.0-9,000	10,000
	5 Impact Strength, Notched Izod (73°F)	Ft-lb/in	no break	0.6	0.5	1.2	1.4-1.8	0.5
	6 Elongation at Break (73°F)	%	600	50	25	4	35-55	20
	7 Tensile Modulus of Elasticity (73°F)	PSI	34,000	425,000	480,000	802,000	375-475,000	410,000
	8 Flexural Modulus of Elasticity (73°F)	PSI	4,000	450,000	460,000	644,000	375-475,000	475,000
	9 Hardness - Rockwell & Burnell (73°F)	Various Scales	10	R115	R112	R121	R110-115	R110
	10 Density	Lbs/in ³	0.033	0.041	-	0.042	-	0.41
Wear	11 Coefficient of Friction (Dynamic)	None	-	0.25	0.20	0.32	0.11-22	0.18
	12 Wear Factor (K) +	in ³ - min Ft-lb-Hr	-	80 2,700	90 3000	19 5000	4 16,000	9 15,000
	13 Limiting PV	PSI. FPM	-	-	-	-	-	-
	14 Abrasion resistance Index	None	63	54	-	-	-	38
Thermal	15 Continuous Service Temp - in Air (max)	°F	-	210	220	230	230	200
	16 Deflection Temperature (264PSI)	°F	105	200	200	194	200	200
	17 Melting Point	°F	-	500	500	491	450	420
	18 Deformation Under Load (2000PSI. 122°F)	%	-	2.0	-	-	.7 - .8	0.9
	19 Coefficient of Linear Thermal Expansion	in/in°F	1.61x10 ⁻⁴	5.5x10 ⁻⁵	4.0x10 ⁻⁵	3.5 x10 ⁻⁵	5.0x10 ⁻⁵	5.0x10 ⁻⁵
Electrical	20 Dielectric Strength	Volts/Mil	700	400	350	350	50	400
	21 Volume Resistivity	Ohm-CM	1x10 ¹⁴	4.5x10 ¹³	-	1x10 ¹⁵	>10 ¹³	>10 ¹³
	22 Dielectric Constant (60 Hz)		2.63	4.1	-	4.0	3.7	-
	23 Dielectric Constant (1 KHz)		-	4.0	-	3.4	3.7	-
24 Dielectric Constant (1 MHz)		-	3.4	-	-	3.7	-	
Water Absorption	25 Water Absorption (24 Hours)	%	0.04	0.3	0.3	1.2	.5 - 6	.25
	26 Water Absorption (Saturation)	%	-	7.0	7.0	8.5	4.0 - 5.0	7.0
Optical	27 Light Transmittance	None	N/A	N/A	N/A	N/A	N/A	N/A
	28 Refractive Index	%	N/A	N/A	N/A	N/A	N/A	N/A
	29 Haze (Initial)	%	N/A	N/A	N/A	N/A	N/A	N/A
	30 Haze (24 days, 104°F)	%	N/A	N/A	N/A	N/A	N/A	N/A



Property		Units	Nylon Structural (13) 13% Glass	Nylon Structural (30) 30% Glass	Nylon Wear Resistant	PBT	PEEK Bearing & Wear	Ketron PEEK
			M-1020		Hyd-Cast MDS Nylatron GSM	Hydex 4101 Valox		Vitrex 450G Orlon
Mechanical	1 Tensile Strength (73°F)	PSI	14,000	27,000	11,000	7,500	11,000	16,000
	2 Flexural Strength (73°F)	PSI	15,500	39,100	16,000	12,000	27,5000	25,000
	3 Compressive Strength (10% Deflection)	PSI	22,800	-	14,000	12,800	26,700	20,000
	4 Shear Strength (73°F)	PSI	-	-	10,500	7,700	10,000	8,000
	5 Impact Strength, Notched Izod (73°F)	Ft-lb/in	0.9	2.1	0.5	1.0	.7	1.0
	6 Elongation at Break (73°F)	%	3.5	3	30	200	2	20
	7 Tensile Modulus of Elasticity (73°F)	PSI	1,200,000	-	400,000	377,000	850,000	500,000
	8 Flexural Modulus of Elasticity (73°F)	PSI	700,000	1,200,000	500,000	330,000	1,100,000	600,000
	9 Hardness - Rockwell & Burnell (73°F)	Various Scales	R122	M101	R110	M120	M85	R126
	10 Density	Lbs/in ³	10.045	0.049	0.041	0.046	0.051	0.047
Wear	11 Coefficient of Friction (Dynamic)	None	2.8	-	0.20	0.25	0.21	0.40
	12 Wear Factor (K) +	in ³ - min Ft-lb-Hr	140 -	- -	90 3000	68 2,800	100 35,000	375 8,500
	13 Limiting PV	PSI. FPM	-	-	50		100	55
	14 Abrasion resistance Index	None	-	-				
Thermal	15 Continuous Service Temp - in Air (max)	°F	212	212	200	245	482	480
	16 Deflection Temperature (264PSI)	°F	385	490	200	130	383	320
	17 Melting Point	°F	491	-	420	428	644	640
	18 Deformation Under Load (2000PSI. 122°F)	%	-	-	0.75	-	-	-
	19 Coefficient of Linear Thermal Expansion	in/in°F	1.5x10 ⁻⁵	1.2x10 ⁻⁵	3.5x10 ⁻⁵	7.8x10 ⁻⁵	1.7x10 ⁻⁵	2.6x10 ⁻⁵
Electrical	20 Dielectric Strength	Volts/Mil	525	530	400	400	480	480
	21 Volume Resistivity	Ohm-CM	1x10 ¹⁶	1x10 ¹⁶	-	4x10 ¹⁶	<10 ⁴	>10 ¹³
	22 Dielectric Constant (60 Hz)		-	3.5	3.7	3.3	-	3.3
	23 Dielectric Constant (1 KHz)		-	3.24	3.7	-	-	-
24 Dielectric Constant (1 MHz)		-	-	3.7	-	-	3.25	
Water Absorption	25 Water Absorption (24 Hours)	%	1.2	0.07	0.3	0.08	0.051	0.10
	26 Water Absorption (Saturation)	%	7.1	-	7.0	0.50	0.3	.50
Optical	27 Light Transmittance	None	N/A	N/A	N/A	N/A	N/A	N/A
	28 Refractive Index	%	N/A	N/A	N/A	N/A	N/A	N/A
	29 Haze (Initial)	%	N/A	N/A	N/A	N/A	N/A	N/A
	30 Haze (24 days, 104°F)	%	N/A	N/A	N/A	N/A	N/A	N/A



Property		Units	PEI Poly- etherimide	PEI Structural (20) 20% Glass	PETP PET	PET	PETG	Phenolic Bearing Grade	Phenolic Canvas Type C
			Ultem 1000	Ultem 2300	Ertalyte	Ertalyte TX	Vivak	Orkot TLG	Micarta Grade CH-26000
Mechanical	1 Tensile Strength (73°F)	PSI	16,500	17,000	12,400	10,500	7,700	8,000	13,000
	2 Flexural Strength (73°F)	PSI	20,000	30,000	18,000	14,000	11,200	10,000	20,000
	3 Compressive Strength (10% Deflection)	PSI	22,000	32,000	15,000	15,520	-	50,000	39,000
	4 Shear Strength (73°F)	PSI	15,000	-	8,000	8,500	-	12,000	13,000
	5 Impact Strength, Notched Izod (73°F)	Ft-lb/in	0.5	1.0	0.5	0.4	1.7	>10.0	2.3
	6 Elongation at Break (73°F)	%	80	3.0	20	5	75	-	-
	7 Tensile Modulus of Elasticity (73°F)	PSI	500,000	800,000	460,000	500,000	320,000	-	-
	8 Flexural Modulus of Elasticity (73°F)	PSI	500,000	900,000	450,000	360,000	310,000	470,000	-
	9 Hardness - Rockwell & Burnell (73°F)	Scales	M112	M114	R125	R115	R115	M100	M100
	10 Density	Lbs/in ³	0.045	0.051	0.050	-	0.047	0.045	0.053
Wear	11 Coefficient of Friction (Dynamic)	None	0.42	-	0.20	.19	-	0.21	-
	12 Wear Factor (K) +	in ³ - min Ft-lb-Hr	2900 1,875	-	60 2,700	35 6000	-	- 25,000	-
	13 Limiting PV	PSI. FPM							
	14 Abrasion resistance Index	None	116	-	-	-	-	-	1070
Thermal	15 Continuous Service Temp - in Air (max)	°F	340	340	210	210	-	266	248
	16 Deflection Temperature (264PSI)	°F	400	410	240	180	157	-	-
	17 Melting Point	°F	-	-	491	491	-	-	-
	18 Deformation Under Load (2000PSI. 122°F)	%	-	-	-	-	-	-	-
	19 Coefficient of Linear Thermal Expansion	in/in°F	3.1x10 ⁻⁵	1.1x10 ⁻⁵	3.3x10 ⁻⁵	4.5x10 ⁻⁵	3.8x10 ⁻⁵	-	-
Electrical	20 Dielectric Strength	Volts/Mil	830	770	385	-	420	-	200
	21 Volume Resistivity	Ohm-CM	6.7x10 ¹⁷	3.0x10 ¹⁶	>10 ¹³	>10 ¹³	-	-	-
	22 Dielectric Constant	(60 Hz)	3.20	-	3.3	-	-	-	-
	23	(1 KHz)	-	4.0	3.2	-	3.4	-	-
	24	(1 MHz)	-	-	-	-	-	-	-
Water Absorption	25 Water Absorption (24 Hours)	%	0.25	0.18	0.06	.07	-	<0.1	1.8
	26 Water Absorption (Saturation)	%	1.25	0.90	0.47	0.9	-	-	3.5
Optical	27 Light Transmittance	None	N/A	N/A	N/A	N/A	86	N/A	N/A
	28 Refractive Index	%	N/A	N/A	N/A	N/A	1.86	N/A	N/A
	29 Haze (Initial)	%	N/A	N/A	N/A	N/A	1.0	N/A	N/A
	30 Haze (24 days, 104°F)	%	N/A	N/A	N/A	N/A	N/A	N/A	N/A



Property		Units	Phenolic Linen Grade L	Polyamide imide Bearing Grd	Polyamide imide Electrical Grade	Polyamide imide 30% GF	Poly- carbonate	Poly- carbonate Abrasion Resistant	Poly- carbonate Machine Grade	
			Micarta L	Torlon 4301	Torlon 4203	Torlon 5030	Hyzod GP	Hyzod AR	Zelux Hydex 4301	
Mechanical	1	Tensile Strength (73°F)	PSI	11,500	12,000	18,000	22,500	9,000	9,500	9,500
	2	Flexural Strength (73°F)	PSI	19,000	23,000	24,000	48,300	13,500	13,500	13,500
	3	Compressive Strength (10% Deflection)	PSI	36,000	22,000	24,000	38,300	10,400	12,500	12,500
	4	Shear Strength (73°F)	PSI	13,000	16,400	16,000	20,100	9,200	5,800	-
	5	Impact Strength, Notched Izod (73°F)	Ft-lb/in	1.6	3.0	10.0	-	13	16	14
	6	Elongation at Break (73°F)	%	-	0.8	2.0	-	100	100	110
	7	Tensile Modulus of Elasticity (73°F)	PSI	-	960,000	600,000	-	340,000	345,000	-
	8	Flexural Modulus of Elasticity (73°F)	PSI	-	800,000	600,000	1,700,000	345,000	340,000	340,000
	9	Hardness - Rockwell & Burnell (73°F)	Scales	M100	M106	M120	E94	R118	M70	M70
	10	Density	Lbs/in ³	0.052	0.052	-	0.058	0.043	0.044	0.044
Wear	11	Coefficient of Friction (Dynamic)	None	-	0.2	3.5	-	-	-	.22 -
	12	Wear Factor (K) +	in ³ - min Ft-lb-Hr	-	10	50	-	-	-	120
	13	Limiting PV	PSI. FPM	-	25,500	12,500	-	-	-	-
	14	Abrasion resistance Index	None	-	236	-	-	-	-	-
Thermal	15	Continuous Service Temp - in Air (max)	°F	248	500	500	475	250	250	250
	16	Deflection Temperature (264PSI)	°F	-	534	532	539	270	275	290
	17	Melting Point	°F	-	-	-	-	-	-	-
	18	Deformation Under Load (2000PSI. 122°F)	%	-	-	-	-	0.3	-	0.3
	19	Coefficient of Linear Thermal Expansion	in/in°F	-	1.4x10 ⁻⁵	1.7x10 ⁻⁵	0.9x10 ⁻⁵	3.75x10 ⁻⁵	-	3.75x10 ⁻⁵
Electrical	20	Dielectric Strength	Volts/Mil	250	-	-	840	>400	380	380
	21	Volume Resistivity	Ohm-CM	-	3x10 ⁻¹⁵	>10 ¹⁶	6x10 ⁻¹⁶	2.1x10 ⁻¹⁶	1x10 ⁻¹⁶	1x10 ⁻¹⁷
	22	Dielectric Constant	(60 Hz)	-	-	-	-	3.17	2.9	3.17
	23		(1 KHz)	-	6.0	-	4.4	-	2.9	2.96
	24		(1 MHz)	-	5.4	-	4.2	2.96	2.9	-
Water Absorption	25	Water Absorption (24 Hours)	%	1.3	0.28	-	0.24	0.2	0.15	0.15
	26	Water Absorption (Saturation)	%	2.3	-	-	-	-	0.35	0.35
Optical	27	Light Transmittance	None	N/A	N/A	N/A	N/A	85	89	N/A
	28	Refractive Index	%	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	29	Haze (Initial)	%	N/A	N/A	N/A	N/A	1.0	1	1.0
	30	Haze (24 days, 104°F)	%	N/A	N/A	N/A	N/A	N/A	N/A	N/A



Property		Units	Polyether-sulfone (PES)	Poly-propylene Natural	Poly-styrene High Impact	Poly-sulfone (PSO)	Poly-urethane Rigid	PPO	
			Vitrex Radel R	Protec, Proteus		Hydex 6201 Udel P-1700	Hydex 302 isoplast 302	Noryl EN265	
Mechanical	1	Tensile Strength (73°F)	PSI	10,100	4,800	4,000	10,200	12,000	9,600
	2	Flexural Strength (73°F)	PSI	13,200	7,000	-	15,000	14,000	15,000
	3	Compressive Strength (10% Deflection)	PSI	14,350	6,720	-	13,900	10,000	-
	4	Shear Strength (73°F)	PSI	-	5,710	-	9,000	-	-
	5	Impact Strength, Notched Izod (73°F)	Ft-lb/in	2.6	1.9	1.4	1.3	2.4	3.5
	6	Elongation at Break (73°F)	%	80	1.2	50	100	30	25
	7	Tensile Modulus of Elasticity (73°F)	PSI	340,000	190,000	260,000	360,000	280,000	372,000
	8	Flexural Modulus of Elasticity (73°F)	PSI	380,000	180,000	-	390,000	330,000	380,000
	9	Hardness - Rockwell & Burnell (73°F)	Scales	R122	R92	L56	M69	R121	R119
	10	Density	Lbs/in ³	0.051	0.032	-	0.046	0.043	0.039
Wear	11	Coefficient of Friction (Dynamic)	None	-	-	-	0.37	-	0.39
	12	Wear Factor (K) +	in ³ - min Ft-lb-Hr	-	-	-	-	-	3000
	13	Limiting PV	PSI. FPM	-	-	-	1500	-	-
	14	Abrasion resistance Index	None	-	122	-	-	-	-
Thermal	15	Continuous Service Temp - in Air (max)	°F	392	180	-	300	280	220
	16	Deflection Temperature (264PSI)	°F	420	210	-	345	280	254
	17	Melting Point	°F	633	330	-	-	465	310
	18	Deformation Under Load (2000PSI. 122°F)	%	-	-	-	-	-	-
	19	Coefficient of Linear Thermal Expansion	in/in°F	3.1x10 ⁻⁵	4.3x10 ⁻⁴	-	3.1x10 ⁻⁵	3.2x10 ⁻⁵	3.3x10 ⁻⁵
Electrical	20	Dielectric Strength	Volts/Mil	360	-	700	425	400	500
	21	Volume Resistivity	Ohm-CM	>10 ⁻¹⁵	1x10 ⁻¹⁷	1x10 ⁻¹⁹	5x10 ⁻¹⁶	3x10 ⁻¹⁶	1x10 ⁻¹⁷
	22	Dielectric Constant (60 Hz)		3.6	2.3	-	3.15	2.6	2.69
	23	Dielectric Constant (1 KHz)		3.5	-	2.40	3.10	-	-
24	Dielectric Constant (1 MHz)		3.45	-	-	3.07	-	2.67	
Water Absorption	25	Water Absorption (24 Hours)	%	0.37	0.008	-	0.3	0.14	0.07
	26	Water Absorption (Saturation)	%	1.10	-	-	0.62	-	0.2
Optical	27	Light Transmittance	None	N/A	N/A	N/A	N/A	88	N/A
	28	Refractive Index	%	N/A	N/A	N/A	N/A	N/A	N/A
	29	Haze (Initial)	%	15.0	N/A	N/A	N/A	N/A	N/A
	30	Haze (24 days, 104°F)	%	N/A	N/A	N/A	N/A	N/A	N/A



			PPS	PVC Type I	PVC Type II	PVDF	Stainless Steel	TFE Fluoro- carbon	
			Ryton Techtron	Vintec I	Vintec II	Kynar-740 Solef	304-2B	Telfon	
Mechanical	1	Tensile Strength (73°F)	PSI	10,000	7,000	6,070	8,000	85,000	3,350
	2	Flexural Strength (73°F)	PSI	18,000	12,500	-	15,000	-	no break
	3	Compressive Strength (10% Deflection)	PSI	18,000	10,830	-	-	-	-
	4	Shear Strength (73°F)	PSI	9,250	9,240	-	-	-	-
	5	Impact Strength, Notched Izod (73°F)	Ft-lb/in	0.6	1.3	-	3	-	-
	6	Elongation at Break (73°F)	%	5	25	145	50-250	60	210
	7	Tensile Modulus of Elasticity (73°F)	PSI	325,000	410,000	345,000	300,000	29x103	70,000
	8	Flexural Modulus of Elasticity (73°F)	PSI	370,000	420,000	-	325,000	-	100,000
	9	Hardness - Rockwell & Burell (73°F)	Scales	M93	R112	R107	R95	B80	R15
	10	Density	Lbs/in ³	0.048	0.053	-	0.063	0.286	0.079
Wear	11	Coefficient of Friction (Dynamic)	None	0.4	-	-	0.14	0.19	0.07
	12	Wear Factor (K) +	in ³ - min Ft-lb-Hr	>2000 3000	- -	- -	- -	- -	- -
	13	Limiting PV	PSI. FPM						
	14	Abrasion resistance Index	None	168	-	-	-	84	78
Thermal	15	Continuous Service Temp - in Air (max)	°F	425	160	-	285	1700	500
	16	Deflection Temperature (264PSI)	°F	250	154	158	183	-	115
	17	Melting Point	°F	540	360	-	345	2550	621
	18	Deformation Under Load (2000PSI. 122°F)	%	-	-	-	-	-	5
	19	Coefficient of Linear Thermal Expansion	in/in°F	2.8x10 ⁻⁵	7.3x10 ⁻⁵	7x10 ⁻⁵	7.1x10 ⁻⁵	9.2x10 ⁻⁶	6.5x10 ⁻⁵
Electrical	20	Dielectric Strength	Volts/Mil	540	552	-	630	-	-
	21	Volume Resistivity	Ohm-CM	4.5x10 ¹⁶	1x10 ¹⁶	>10 ¹⁶	1.5x10 ¹⁴	-	-
	22	Dielectric Constant	(60 Hz)	3.0	4	-	10.00	-	-
	24		(1 MHz)	3.0	-	-	9.05	-	-
Water Absorption	25	Water Absorption (24 Hours)	%	0.02	0.1	0.05	0.04	-	-
	26	Water Absorption (Saturation)	%	0.03	-	-	0.10	-	-
Optical	27	Light Transmittance	None	N/A	N/A	N/A	N/A	N/A	N/A
	28	Refractive Index	%	N/A	N/A	N/A	N/A	N/A	N/A
	29	Haze (Initial)	%	N/A	N/A	N/A	N/A	N/A	N/A
	30	Haze (24 days, 104°F)	%	N/A	N/A	N/A	N/A	N/A	N/A



			TFE	TFE	TFE FDA	UHMW	UHMW-PE	
			Fluoro-polymer Bearing Grd	Fluoropolymer Bearing Grd	Bearing Grade	Bulk Material Handling		
			Rulon J	Rulon LR	Fluorosint 207	Tivar 88	Lennite Tivar 1000	
Mechanical	1	Tensile Strength (73°F)	PSI	2,000	1,500	1,500	4,000	4,750
	2	Flexural Strength (73°F)	PSI	-	-	3,000	-	-
	3	Compressive Strength (10% Deflection)	PSI	-	-	3,800	-	-
	4	Shear Strength (73°F)	PSI	-	-	1700	-	3,500
	5	Impact Strength, Notched Izod (73°F)	Ft-lb/in	180	6	1.0	no break	no break
	6	Elongation at Break (73°F)	%	-	150	50	140	325
	7	Tensile Modulus of Elasticity (73°F)	PSI	-	-	250,000	-	90,000
	8	Flexural Modulus of Elasticity (73°F)	PSI	-	-	350,000	115,000	110,000
	9	Hardness - Rockwell & Burnell (73°F)	Scales	D60	D60-75	R50	R70	R64
	10	Density	Lbs/in ³	0.072	0.084	0.080-0.084	-	0.034
Wear	11	Coefficient of Friction (Dynamic)	None	0.20	-	0.01	0.13	0.12
	12	Wear Factor (K) +	in ³ - min Ft-lb-Hr	- 7,500	-	30 8,000	- 8	111 2,000
	13	Limiting PV	PSI. FPM	-	-	-	-	-
	14	Abrasion resistance Index	None	-	-	197	-	10
Thermal	15	Continuous Service Temp - in Air (max)	°F	550	-	500	180	160
	16	Deflection Temperature (264PSI)	°F	-	-	210	-	118
	17	Melting Point	°F	-	-	621	-	-
	18	Deformation Under Load (2000PSI. 122°F)	%	3	3	2.25-2.85	-	7
	19	Coefficient of Linear Thermal Expansion	in/in°F	4.9x10 ⁻⁵	3.5x10 ⁻⁵	5.70.x10 ⁻⁵	1.8x10 ⁻⁴	7.2x10 ⁻⁵
Electrical	20	Dielectric Strength	Volts/Mil	-	500-1100	200	-	2300
	21	Volume Resistivity	Ohm-CM	8.2x10 ¹⁶	1x10 ¹⁵	>10 ¹²	-	1x10 ¹⁸
	22	Dielectric Constant	(60 Hz)	2.4	2.5	2.65	-	2.3
	23		(1 KHz)	-	-	-	-	-
Water Absorption	25	Water Absorption (24 Hours)	%	-	-	<0.35	-	<0.01
	26	Water Absorption (Saturation)	%	-	-	<1.0	-	-
Optical	27	Light Transmittance	None	N/A	N/A	N/A	N/A	N/A
	28	Refractive Index	%	N/A	N/A	N/A	N/A	N/A
	29	Haze (Initial)	%	N/A	N/A	N/A	N/A	N/A
	30	Haze (24 days, 104°F)	%	N/A	N/A	N/A	N/A	N/A