

TYPICAL PROPERTIES OF FLUOROPOLYMERS

ASTM or UL Test	Property	PTFE	FEP	PFA	PVDF	Modified ETFE
PHYSICAL						
	Density (g/cm <sup>2</sup> )	2.14-2.19	2.12-2.17	2.12-2.17	1.75-1.76	1.71-1.76
	Max. Continuous Operating Temperature (°C)	250-260	204	250-260	130-170	150-180
	Flammability	Non-combustible	Non-combustible	Non-Combustible	Self-extinguishing	Self-extinguishing
	Water Absorption (%)	<0.01	<0.01	0.00	0.00	<0.1
	Tensile Strength at Break (psi)	3000-5000	2700-3100	4000-4300	3500-7250	6500
	Elongation at Break (%)	200-400	250-330	300	300-500	100-400
	Shore Hardness D	55-72	55-60	60-65	73-85	63-75
	Coefficient of Friction vs. Steel	0.05-0.2	0.3-0.35	0.2-0.3	0.2-0.4	0.3-0.5
	Melt Temperature (°C)	164	253-282	300-310	165-178	205-275
	Coefficient of Linear Expansion	10-16	8-14	10-16	8-12	8-12
	Dielectric Strength Short Term (v/m)					
		480	500-600	500	260-280	400
	Izod Impact (ft-lb/in. of notch)	3	No break	No break	2.5-80	No break
	Barrier Properties Water (g-mil/100 in <sup>2</sup> )					
		.295	.221	.33	2.51	1.4
	Barrier Properties Oxygen (cc-mil/100 in <sup>2</sup> )					
		998	715	1,142	3.4	184
	Mold (linear) Shrinkage (in/in)	0.030-0.060	0.030-0.060	0.040	0.020-0.035	0.030-0.040
MECHANICAL						
D638	Tensile strength (psi)	3,350	3,000	4,000	5,200-7,400	6,500
D638	Elongation (%)	300	300	300	100-300	275
D638	Tensile modulus (10 <sup>5</sup> psi)	0.5	—	—	1.6	1.2
D790	Flexural strength (psi)	No break	No break	No break	No break	No break
D790	Flexural modulus (10 <sup>5</sup> psi)	0.5-0.9	0.95	0.95	2.0	2.0
D256	Impact strength, Izod (ft-lb/in of notch)	3.5	No break	No break	3-4	No break
D785	Hardness					
	Rockwell	—	—	—	—	R50
	Shore D	50-65	55	60	80	—
THERMAL						
C177	Thermal conductivity (Btu-in/hr-ft <sup>2</sup> -°F)	1.7	1.4	1.8	0.7-0.9	1.65
D696	Coefficient of thermal expansion (10 <sup>-5</sup> in/in-°F)	5.5-8.4	4.6-5.8	6.7	8.0-8.5	5.2
D648	Deflection temperature (°F)					
	At 264 psi	132	124	118	195	165
	At 66 psi	250	158	164	300	220
UL 94	Flammability rating	V-0	V-0	V-0	V-0	V-0
ELECTRICAL						
D149	Dielectric strength (V/mil)					
	Short time, 1/8-in thk	500-600	500-600	500-600	260	400-500
D150	Dielectric constant					
	At 1 kHz	2.1	2.1	2.1	7.5	2.6
D150	Dissipation factor					
	At 1 kHz	0.00005	0.00005	0.0003	0.019	0.0008
D257	Volume resistivity (ohm-cm)					
	At 73°F, 50% RH	>10 <sup>18</sup>	>10 <sup>18</sup>	>10 <sup>18</sup>	2×10 <sup>14</sup>	10 <sup>16</sup>
D495	Arc resistance (s)	>300	>180	>180	50-70	75
OPTICAL						
D542	Refractive index	1.350	1.344	1.350	1.42	1.403
D1003	Transmittance (%), 1-mil film	—	>95	>95	>90	—
FRICTIONAL						
—	Coefficient of friction					
	Against steel (100 psi, 10 fpm)	0.050	0.330	0.214	0.14	0.400

\*Crystalline compound. †Below and above 135°F.