

Property Comparison of Various Fluoropolymers by Interplast, Inc.

Property	ASTM test method/test condition	PTFE	PFA	FEP	ETFE	CTFE
Physical Properties						
Specific gravity	D792 D570/24 hrs 1/2"t	2.13~2.22	2.12~2.17	2.12~2.17	1.70~1.76	2.10~2.18
Water absorption (%)		<0.00	<0.03	<0.01	<0.1	<0.00
Mold shrinkage (cm/cm)		0.02 ~0.05	0.04	0.03~0.06	0.03~0.04	0.015~0.020
Contact angle (degree)	Angle to level	110	115	115	96	84
Thermal Properties						
Thermal conductivity (cal/sec/cm)	C177	6 X 10 ⁻⁴	—	6 X 10 ⁻⁴	5.7 X 10 ⁻⁴	4.7~5.3 X 10 ⁻⁴
Coefficient of linear thermal expansion (1/°C)	D696/23~60°C	10 X 10 ⁻⁵	12 X 10 ⁻⁵	8.3~10.5 X 10 ⁻⁵	5~9 X 10 ⁻⁵	4.5 ~ 7.0 X 10 ⁻⁵
Melting point (°C)		327	302~310	270	260	210~212
Melt viscosity (coise)		10 ⁻¹¹ ~ 10 ⁻¹³ (340-380°C)	10 ⁻⁴ ~ 10 ⁻⁵ (380°C)	4X10 ⁻⁴ ~10 ⁻⁵ (380°C)	10 ⁻⁴ ~10 ⁻⁵ (300-330°C)	10 ⁻⁷ (23°C)
Maximum temp. for continuous use (°C/°F)		260/500	260/500	200/392	150/302	120/248
Mechanical Properties						
Tensile strength (kgf/cm ²)	D638/23°C	140~350	280~315	190~220	410~470	320~420
Elongation (%)	D638/23°C	200~400	280~300	250~330	420~440	80~250
Compression strength (kgf/cm ²)	D695/1% deformation, 25°C	50~60	50~60	50~60	109	90~120
Tensile modulus (kgf/cm ²)	D638/23°C	4,000	—	3,500	5,000~8,000	10,500~21,000
Hexural Modulus (kgf/cm ²)	D790/23°C	5,000~6,000	6,600~7,000	5,500~6,500	9,000~14,000	13,000~18,000
Impact strength (ft-lb/in)	D256/23°C Izod	3.0	—	No breakdown	No breakdown	2.5~2.7
Hardness (Shore)	Durometer	D50~D65	D60	D55	D75	D90
Deformation under load (%)	D621/100°C 70 kfg/cm ² , 24 hrs	5.0	2.4	5.0	5.4	2.6
	D621/25°C 140 kfg/cm ² , 24 hrs	7.0	2.7	3.0	2.3	0.2
Static friction coefficient	Coated steel surface	0.20	0.50	0.50	0.60	0.80
Electrical Properties						
Dielectric constant	D150/10 ³ Hz	2.1	2.1	2.1	2.6	2.3~2.7
	D150/10 ⁸ Hz	2.1	2.1	2.1	2.6	2.3~2.5
Dielectric dissipation factor	D150/10 ³ HZ D150/10 ⁸ HZ	<1 X 10 ⁻⁵ 2 X 10 ⁻⁵	1 X 10 ⁻⁵ 3 X 10 ⁻⁵	6 X 10 ⁻⁵ 5 X 10 ⁻⁵	8 X 10 ⁻⁴ 5 X 10 ⁻³	(2.3~2.7)X10 ⁻² 1 X 10 ⁻²
Dielectric breakdown strength (V/ml)	D149/Short time, 1/8 in	480	500	500~600	400	500
Volume resistivity (ohm-cm)	D257	>10 ⁻¹⁸	>10 ⁻¹⁸	>10 ⁻¹⁸	>10 ⁻¹⁸	>10 ⁻¹⁸
Chemical resistance Weatherability Combustibility (%)		Excellent Excellent >95	Excellent Excellent >95	Excellent Excellent >95	Excellent Excellent >31	Excellent Excellent >95
	D2863/Oxygen concentration index					