



TEF - CAP INDUSTRIES

1155 Phoenixville Pike * West Chester, PA 19380 * Phone 610 692 2576

Property Comparison of Fluoroplastic/Fluoropolymer Resins

Properties	ASTM or Unit	<u>PTFE</u>	<u>FEP</u>	<u>PFA</u>	<u>ETFE</u>	<u>ECTFE</u>
MECHANICAL PROPERTIES						
Specific Gravity	D792	2.13-2.20	2.12-2.17	2.12-2.17	1.70-1.76	1.68
Elongation %	D638	200-450	250-330	280-400	420-460	200-300
Tensile Strength (psi)	D638	2000-4500	2800-5000	4000-4500	6100-6800	6600-7800
Flexural Strength (psi)	D790	no break	no break	no break	5500	7000
Compressive Strength (psi)	D695	3500	2200		2500	1276-1711
Tensile Elastic Modulus (Young's Modulus) (psi)	D638	57,000	50,000	72,500-87,000	85000-95000	240,000
Flexural Modulus (psi)	D790	71,000-85,000	78,000-92,000	94,000-99,000	128,000-171,000	240,000
Flexural Modulus 103MPa (103kgf/cm ²)	D790	0.5-0.6 (5.0-6.0)	0.5-0.6 (5.5-6.5)	0.6-0.7 (6.6-7.0)	0.9-1.4 (9.0-14.0)	1.4-1.8 (14-18)
Flex Life (MIT cycles)	D2176	>1,000,000	5,000-80,000	10,000-500,000	10,000-27,000	na
Hardness Durometer Shore D	D636	50-65	55	55-60	75	75-90
Coefficient of Friction	(on steel)	0.02	0.05	0.2	0.06	0.19
Abrasion Resistance 1000 revs.	Taber	12	14-20	9-17	na	0.005
Impact Strength IZOD 73°F/23°C notched ft/lbs/in	D256	3	no break	no break	no break	no break
THERMAL PROPERTIES						
Melting Point	°C (°F)	327 (621)	260 (500)	305 (582)	267 (512)	240 (464)
Upper Service Temperature(20000h)	°C (°F)	260 (500)	204 (400)	260 (500)	176 (348)	150-170 (300-340)
Flammability	UL 94	V-0	V-0	V-0	V-0	V-0

Thermal Conductivity BTU/hr/sq ft/deg F in		1.7	1.4	1.3	1.65	1.6
Thermal Conductivity Cal-cm/s-cm ² ,°C		6 x 10 ⁻⁴	6 x 10 ⁻⁴	6 x 10 ⁻⁶	5.7 x 10 ⁻⁴	4.7-5.3 x 10 ⁻⁴
Linear Coefficient of Thermal Expansion	D696 10 ⁻⁵ °C	>11.6	8.3-10.5	13	13	na
Heat of Fusion	BTU/LB	29-37	11	13	20	na
Heat of Combustion	BTU/LB	2200	2200	2300	8100	na
Low Temperature Embrittlement	°C (°F)	-268 -450	-268 -450	-268 -450	-100 -148	-76 -105

ELECTRICAL PROPERTIES

Dielectric Constant	D150/10 ³ Hz	2.1	2.1	2.1	2.6	2.5
	D150/10 ⁶ Hz	2.1	2.1	2.1	2.6	2.59
Dielectric Strength	D149/125 MIL	500	500	500	na	na
	D149/10 MIL	≥1400	≥1400	≥1400	1600	na
Volume Resistivity	D257/ohm-cm	>10 ¹⁸	>10 ¹⁸	>10 ¹⁸	>10 ¹⁶	>10 ¹⁶
Surface Resistivity	D257/ohm-cm	>10 ¹⁷	>10 ¹⁷	>10 ¹⁷	>10 ¹⁵	>10 ¹⁴ -10 ¹⁵

GENERAL PROPERTIES

Chemical/Solvent Resistance	D543	Excellent	Excellent	Excellent	Excellent	Excellent
Water Absorption 24h,%	D570	<0.01	<0.01	<0.03	<0.03	< 0.1
Deformation Under Load	*D621 100°C	5.0	5.0	2.4	5.4	2.6
Deformation Under Load	**D621 25°C	7.0	3.0	2.7	2.3	0.2
Refractive Index		1.35	1.338	1.34	1.40	1.447
Arc Resistivity, % sec		>300	>300	>300	75	na
	D495	>200	>300	>300	122	135
Limiting Oxygen Index, %	D2863	>95	>95	>95	31	60
Properties	ASTM or Unit	<u>PTFE</u>	<u>FEP</u>	<u>PFA</u>	<u>ETFE</u>	<u>ECTFE</u>

*6.8MPa (986psi), 24h
**13.7MPa(1987psi), 24h