



## TYPICAL PROPERTIES OF TEFLON INDUSTRIAL FLUOROPOLYMER COATINGS

### Thermal Properties

Property	ASTM Standard	Unit	PTFE	FEP	PFA	ETFE
Melting Point	D3418	°C	327	260	305	267
		°F	621	500	582	512
Cure Temperature		°C	380-430	360-390	380-400	300-325
		°F	715-805	680-735	715-750	575-615
Max Use Temperature						
· Continuous		°C	290	205	260	150
		°F	550	400	500	300
· Intermittent		°C	315	230	290	200
		°F	600	450	550	390
Flame Rating**	UL94		VO	VO	VO	VO
Limiting Oxygen Index	D2863	%	>95	>95	>95	30-36
Heat of Combustion	D240	MJ/kg	5.1	5.1	5.3	13.7
		Btu/lb	2,200	2,200	2,300	5,900
Thermal Conductivity		Btu·in/h·ft <sup>2</sup> ·°F	1.7	1.4	1.3	1.65
		W/m·k	0.25	0.2	0.19	0.24

# Mechanical Properties

Property	ASTM Standard	Unit	PTFE	FEP	PFA	ETFE
Specific Gravity	D792		2.15	2.15	2.15	1.76
Tensile Strength	D1457, D1708, D638	MPa	21-35	23	25	40-47
		psi	3,000-5,000	3,400	3,600	5,800-6,700
Elongation	D1457, D1708, D638	%	300-500	325	300	150-300
Flexural Modulus	D790	MPa	500	600	600	1200
		psi	72,000	85,000	85,000	170,000
Folding Endurance	D2176	(MIT) cycles	>106	5-80 x 103	10-500 x 103	10-27 x 103
Impact Strength	D256	J/m	189	No break	No break	No break
		ft·lb/in	3.5			
Hardness	D2240	Shore D	50-65	56	60	72
		pencil	HB	HB		
Abrasion Resistance						
· Bell Abrasion (1)		g/μm	85			
· Sliding Arm (2)		mg	7.9-9.7	11.1-15.2		13.4
· Tabor Abrasion (3)		mg	12	14.8		
Scratch Resistance scratch master						
· initial (4)		kg	5.7-7.0	5.1-11.4		
· complete (5)		kg	7.3-10.7	8.5-13.2		
Coefficient of Friction	D1894					
· static			0.12-0.15	0.12-0.20	0.2	0.24-0.50
· dynamic			0.05-0.10	0.08-0.3		0.3-0.4
Contact Angle						
· water		degree	0.12-0.15	0.12-0.20	0.2	0.24-0.50

- 1) Bell Abrasion Tester: grams abrasive/micrometers
- 2) Sliding Arm Test: 1,000 cycles, 500 gr load, 400 Emery paper, 35.5 sq.cm surface
- 3) Tabor Abrasion: Cs 17 wheel, 1 kg load, 1,000 cycles, weight loss in mg
- 4) Scratch Master: initial = first sign of substrate

- 5) Salt Spray: complete = total removal of film
- 6) Salt Spray Resistance: 5% NaCl @ 35°C/95°F
- 7) Detergent Resistance: hours to failure
- 8) Dielectric Strength: 100 micrometers film

## Chemical Properties

Property	ASTM Standard	Unit	PTFE	FEP	PFA	ETFE	
Chemical/Solvent Resistance	D543		Excellent	Excellent	Excellent	Excellent	
Water Absorption, 24 h	D570	%	<0.01	<0.01	<0.03	<0.03	
Salt Spray Resistance (6)	B-117						
· on aluminum		Hours	744+	744+	1000	1000	
· on steel		Hours		192			
Detergent Resistance (7)							
· on aluminum		Hours		264	744		
· on grit-blasted aluminum		Hours		624	600		
· on grit-blasted steel		Hours		24	480		
Weather Resistance	Florida Exposure	Years Unaffected		20	20	10	15

## Electrical Properties

Property	ASTM Standard	Unit	PTFE	FEP	PFA	ETFE
Dielectric Constant	D150	1 MHz	21	2.1	2.1	2.6
Dielectric Strength (8)	D149	V/μm	18	53	80	79
Dissipation Factor	D150	1 MHz	<0.0001	0.0006	0.0001	0.007
Arc Resistance	D495	sec	>300	>300	>180	122
Volume Resistivity	D257	ohm-cm	>10 <sup>16</sup>	>10 <sup>18</sup>	>10 <sup>19</sup>	>10 <sup>17</sup>
Surface Resistivity	D257	ohm/sq	>10 <sup>16</sup>	>10 <sup>16</sup>	>10 <sup>17</sup>	>10 <sup>15</sup>