

Typical Comparative Properties of Virgin and Filled PTFE

Fillers and Percentages by Weight										
Table 1 PROPERTY	Unfilled Virgin PTFE	Glass Fibre 15%	Glass Fibre 25%	Graphite 15%	Glass Fibre, 20% Graphite, 5%	Glass Fibre 15% Mos2, 5%	Bronze 60%	Bronze, 55% Mos2, 5%	Carbon Graphite 25%	Carbon Graphite 35%
Specific Density	2.16	2.19	2.22	2.13	2.18	2.25	3.6	3.5	2.07	2.02
Tensile Strength (psi)	3,000	2,700	1500- 2,500	2,700	2,400	2,500	2,000	1,600	1,800	1,375
Elongation, % (1)	200	175	150	150	150	100	50	50.00	100	50
Stress at 10% (1)	1,600	1,200	1,200	1,600	1,300	1,300	2,000	1,600	1,800	1,600
Water absorption, %	0	0.015	0.013	0	0.016	0.010	0			
Coefficient of thermal conductivity, BTU/hr/ft2 (°F/in.) (Kcal/m hr °C) Dielectric Strength (Kv per mil) D149a	1.7 (0.21) 3.5	2.55 (0.32)	3.12 (0.39)	3.12 (0.39)	2.51 (0.31)	2.25 (0.28)	3.25 (0.4)	5.00	5	6.3

Table 2 PROPERTY	Unfilled Virgin PTFE	Glass Fibre 15%	Glass Fibre 25%	Graphite 15%	Glass Fibre, 20% Graphite, 5%	Glass Fibre 15% Mos2, 5%	Bronze 60%	Bronze, 55% Mos2, 5%	Carbon Graphite 25%	Carbon Graphite 35%
Creep Modulus, (2) Psi x 103 (kg/cm)	28 (2)	32 (2.25)	30 (2.1)	50 (3.5)	50 (3.5)	42 (3)	90 (6.3)	120 (8.5)	75 (5.3)	80 (5.6)
Coefficient of linear thermal expansion, 10 ⁵ /in./in. °F (10 ⁵ cm/cm/°C)										
78-200°F MD (25-95°C) CD	6.8 (12.2)	8.0 (14.4) 2.9 (5.2)	7.0 (12.6) 4.2 (7.6)	7.0 (12.6) 4.4 (7.9)	7.7 (13.9) 2.6 (4.7)	8.3 (15.0) 3.5 (6.3)	5.4 (9.7) 4.4 (7.9)	5.6 3.9	6.0 4.7	4.6 4.0
78-300°F MD (25-150°C) CD	7.0 (12.6)	8.4 (15.1) 3.0 (5.4)	7.3 (13.2) 4.2 (7.6)	7.5 (13.5) 4.7 (8.5)	7.7 (13.9) 3.0 (5.4)	8.8 (15.8) 3.6 (6.5)	5.7(10.2) 4.4 (7.9)	6.1 4.1	6.3 4.9	5.2 4.3
78-400°F MD (25-205°C) CD	7.6 (13.2)	9.1 (16.4) 3.4 (6.1)	8.0 (14.4) 4.7 (8.5)	8.1 (14.6) 5.1 (9.2)	8.1 (14.6) 3.2 (5.8)	9.6 (17.3) 3.9 (7.0)	6.4(11.5) 5.0 (9.0)	6.8 4.6	7.0 5.3	6.0 4.6
78-500°F MD (25-260°C) CD	9.1 (16.4)	10.3(18.5) 4.2 (7.6)	9.4 (17.0) 5.6 (10.1)	9.5 (17.6) 6.0 (10.8)	9.2 (16.6) 3.9 (7.0)	11.1(20.0) 4.5 (8.1)	7.8 (14.1) 5.8(10.5)	8.2 5.4	8.6 6.2	7.5 5.4
Hardness, Shore Durometer D	51	54	57	61	56	57	70	70	62	64
Izod impact, ft lb/in (cm kg/cm)	2.9 (15.5)	2.7 (14.9)	2.2 (12.1)	2.6 (14.3)	2.3 (12.7)	2.9 (15.5)	2 (11)	- -	- -	- -
PV Limit, (3) lb/in2 x ft/min (kg x m/cm2 x min)										
10 ft/min (3 m/min)	1,200 (26)	10,000 (215)	10,000 (215)	10,000 (215)	11,000 (235)	11,000 (235)	15,000 (320)	12,500	14,000 (300)	15,000
100 ft/min (30 m/min)	1,800 (39)	12,500 (270)	13,000 (280)	17,000 (365)	15,000 (320)	14,000 (300)	18,500 (400)	12,500	20,000 (430)	20,000
1000 ft/min (300 m/min)	2,500 (54)	15,000 (320)	16,000 (340)	28,000 (600)	22,000 (470)	17,500 (375)	22,000 (470)	12,500	30,000 (640)	12,500
PV for 0.005in (0.13 mm) radial wear in 1,000 hrs (unlubricated)	20 (0.43)	3,000 (65)	5,000 (108)	1,500 (32)	3,000 (65)	5,000 (108)	8,000 (172)	-	4,000 (87)	-
Wear Factor, K (3) (in3 min/ft lb hr) 10-10 (cm3 min/kg m hr) 108	2,500 (2,950)	14 (16.5)	13 (15.4)	50 (60)	12 (14)	15 (18)	6 (7)	5 (-)	12 (14)	10 -
Coefficient of Friction(3)										
Static, 500 psi (35 kg/cm2) Load	0.05-	0.10- 0.13	0.10- 0.13	0.08- 0.10	0.08- 0.10	0.08- 0.10	0.08- 0.10	0.08 0.09	0.08 0.09	0.13 0.16
Dynamic, PV: 5,000 (105), 50 fpm (15 m/min)	0.08 0.01	0.15- 0.24	0.17- 0.24	0.15- 0.18	0.18- 0.27	0.15- 0.27	0.15- 0.22	0.13- -	0.15 0.22	- -

(1) ASTM D 1457-56T

(2) Creep modulus in flexure after 100 hrs at 1000 psi (70 kg/cm2). ASTM D 790-63

(3) Measured in air at room temperature.

(4) Dielectric Strength is dependent on material thickness

Fillers and Percentages by Weight										
Table 3 PROPERTY	Unfilled Virgin PTFE	Glass Fibre 15%	Glass Fibre 25%	Graphite 15%	Glass Fibre, 20% Graphite, 5%	Glass Fibre 15% Mos2, 5%	Bronze 60%	Bronze, 55% Mos2, 5%	Carbon Graphite 25%	Carbon Graphite 35%
Compressive Strength, (psi) D695-54 1% strain *A **B	630 -	1000 850	1200 1120	1080 1090	1000 940	1130 1100	1120 1170	1500 1450	850 900	900 1000
25% strain *A **B	4485 -	5200 3950	5610 4520	5000 5200	5120 4260	6350 5160	7720 7300	- -	- -	- -
0.2% offset *A **B	1100 -	1650 1270	1870 1270	1420 1710	1590 1420	1840 1810	1700 1740	1800 1700	1650 1700	1800 1825
Modulus (psi) D695 *A **B	6.0x104	9.8 x 104 8.5 x 104	11.8x104 10.0x104	9.6 x 104 8.9 x 104	9.5 x 104 9.2 x 104	11.0 x104 11.9 x104	11.0x104 11.4x104	- -	- -	- -
Creep (per cent) D621-59 (modified) Deformation at 78°F, 2000 psi, 24 hr *A **B	14.3 16.7	8.3 13.4	7.1 7.5	8.1 9.5	6.8 6.7	6.9 7.1	6 5.3	4.6 3.6	6 6.3	5.5 5.8
Permanent Deformation *A **B	7.9 8.4	4.1 9	3.9 4.6	4.4 5.3	4.9 3.9	3.8 3.9	2.5 2.3	1.9 1.7	2.5 2.9	2.1 2.6
Deformation at 78°F, 20000 psi, 100 hr *A **B	16.3 18.7	12.6 14.9	8.9 9.4	10.1 11.5	7.6 8.7	7.8 8.1	6.1 6.4	- -	- -	- -
Permanent Deformation *A **B	8.8 9/1	6 7.9	4.4 5.6	6.4 7.3	5.8 5.9	5.6 5.5	2.5 2.5	- -	- -	- -
Deformation at 500°F, 600 psi, 24 hr *A **B	30.1 32.8	16.6 27.7	10.6 27.8	16 15.4	11.3 12.2	9.6 10.9	10.6 8.4	11 10	10.2 10.6	9.2 9.6
Permanent Deformation *A **B	17.4 19.2	11.9 16.2	4.9 17.9	12 10.8	8.4 8.4	6.4 6.8	7.1 4.9	5.6 4.8	5.2 5.6	4.6 5.0

* "A" designates properties tested parallel to direction of moulding;

** "B" designates properties tested perpendicular to moulding direction.

Contact office for price quotation on specific PTFE requirements