TDS - Physical Properties of PTFE and Filled PTFE Products

Physical properties of Virgin PTFE & Filled Grade of PTFE are dependent upon many factors such as Grades of PTFE – Conventional, Modified PTFE or Filled PTFE, Particle size of resin – Fine Cut or Coarse, Particle Shape of Resin – Spherical, Flake, Irregular, Type & content of filler, Manufacturing Process – Compression Molding, Ram Extrusion, Isostatic, Paste Extrusion. Due to this – Physical Properties of PTFE & Filled PTFE Products – have the wide range of Values:-

Sr. No.	Property	Unit	Test Method	Virgin PTFE	Chemically Modified PTFE	15% Glass Filled PTFE	25% Glass Filled PTFE	5% Glass +5% MoS2 Filled PTFE	15% Glass +5% MoS2 Filled PTFE	25% Carbon / 23% Carbon + 2% Graphite Filled PTFE	35% Carbon / 33% Carbon + 2% Graphite Filled PTFE	15% Graphite Filled PTFE	40% Bronze Filled PTFE	40% Bronze + 5% MoS2 Filled PTFE	60% Bronze Filled PTFE	55% Bronze + 5% MoS2 Filled PTFE
1	Colour	-	Visual	Milky White	Shiny White	Light Ivory	Ivory	Light Grey	Grey	Charcoal Black	Jet Black	Dark Grey	Brown	Blackish Brown	Dark Brown	Brownish Black
2	Density	gm / cc	ASTM D-792	2.1 – 2.2	2.1 – 2.15	2.15– 2.22	2.22– 2.25	2.2 – 2.24	2.2 – 2.24	2 – 2.15	2 – 2.1	2.1– 2.15	2.9 – 3.1	2.9 – 3.1	3.8 – 4	3.8 – 4
3	Tensile Strength	kgf/cm^2	ASTM D-638	200 – 300	300 – 400	175 – 250	125 – 200	175 – 250	150 – 200	125 – 175	100 – 150	125 – 175	150 – 200	125 – 175	150 – 200	125 – 175
4	Elongation of Break	%	ASTM D-638	250 – 350	350 – 450	200 – 250	150 – 200	175 – 225	150 – 200	100 – 150	75 – 125	200 – 250	250 – 300	200 – 250	200 – 250	150 – 200
5	Compressive Strength (1% Deformation)	kgf/cm^2	ASRM D-695	35 – 40	45 – 60	55 – 65	60 – 70	50 – 60	55 – 65	50 – 60	55 – 65	40 – 50	70 – 80	75 – 85	100 – 110	100 – 110
-	Compressive Strength (10% Deformation)	kgf/cm^2		140 – 145	170 – 200	180 – 200	190 – 210	160 – 180	180 – 200	160 – 180	180 – 200	150 – 170	200 – 220	210 – 230	250 – 300	250 – 300
6	Deformation under load (Maximum)			-	-	-	-	-	-	-	-	-	-	-	-	-
A	2 Hrs. 23^{0}C 113 kgf	%	ASTM D 621	7	4	6	5	7	6	5	4	6	3	3	2	2
B	24 Hrs. 23^{0}C 113 kgf	%		10	6	8	7	9	8	7	6	8	5	5	4	4
C	Permanent	%		8	5	7	6	8	7	6	5	7	4	4	3	3
7	Impact Strength	j/cm	ASTM D-256	0.5 – 1	2 – 3	1 – 1.5	1 – 1.5	1.5 – 2	1 – 1.5	1.5 – 2	1 – 1.5	1.75 – 2.25	1.5 – 1.75	1.75 – 2.25	1.5 – 1.75	1.75 – 2.25
8	Hardness	Shore D	ASTM D-2240	50 – 55	55 – 60	55 – 60	60 – 70	55 – 60	56 – 62	56 – 62	62 – 68	58 – 62	60 – 65	60 – 65	62 – 68	62 – 68
9	Dimensional Stability		ASTM-D-1710	-	-	-	-	-	-	-	-	-	-	-	-	-
A	Length	%	-	0.5 – 1	0.5 – 1	0.1 – 0.5	0.1 – 0.5	0.1 – 0.5	0.1 – 0.5	0.1 – 0.5	0.1 – 0.5	0.1 – 0.5	0.1 – 0.5	0.1 – 0.5	0.1 – 0.5	0.1 – 0.5
B	Diameter	%	-	0.5 – 1	0.5 – 1	0.1 – 0.5	0.1 – 0.5	0.1 – 0.5	0.1 – 0.5	0.1 – 0.5	0.1 – 0.5	0.1 – 0.5	0.1 – 0.5	0.1 – 0.5	0.1 – 0.5	0.1 – 0.5
10	Coefficient of Friction (Maximum)	-	ASTM-D-1894	-	-	-	-	-	-	-	-	-	-	-	-	-
A	Static P-35 kg/cm^2	-		0.05	0.045	0.065	0.07	0.055	0.060	0.060	0.065	0.055	0.065	0.060	0.070	0.065
B	DynamicP-7 kg/cm^{2}V-0.5	-		0.04	0.035	0.060	0.065	0.050	0.055	0.050	0.055	0.050	0.060	0.055	0.065	0.060
11	Wear Rate (Maximum) X 10^{-4}	$\frac{mm3}{N-m}$	ASTM-G-137	3	2	2.5	2	2.5	2	2.5	2	2.5	1.5	1.5	1	1
12	Water Absorption (Maximum)	%	ASTM D-570	0	0	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
13	Service Temperature	^{0}C	ASTM-D-648	-200 to +250^{0}C	-200 to +250^{0}C	-200 to +250^{0}C	-200 to +250^{0}C	-200 to +250^{0}C	-200 to +250^{0}C	-200 to +250^{0}C	-200 to +250^{0}C	-200 to +250^{0}C	-200 to +250^{0}C	-200 to +250^{0}C	-200 to +250^{0}C	-200 to +250^{0}C
14	Heat Deflection Temperature	^{0}C	ASTM-D-648	55	60	65	65	65	65	65	65	65	65	65	65	65
15	Melting / Softening Temperature	^{0}C	ASTM D-1525	335	335	335	335	335	335	335	335	335	335	335	335	335
16	Dielectric Strength (Short Time)	Kv/mm	ASTM D-149	10 – 15	30 – 32	10 – 12	5 – 6	12 – 14	8 – 10	5 – 6	2 – 3	2 – 3	Conductive	Conductive	Conductive	Conductive

A	**PTFE is chemically inert & unaffected by all known chemicals except molten or dissolved alkali metals–Sodium; Potassium; Rubidium; Cesiurn; Francium & Fluorine gas, certain fluorine compounds & complexes at elevated temperatures. Filled PTFE has inferior chemical resistance depending upon the particular filler.**
B	**Data quoted are average values only & should not be used for design purpose.**
C	**Company has in-house test facility / Laboratory to test above properties. The testing equipments are calibrated as per procedures laid down in QMS-ISO-9001:2015, having traceability with NPL.**

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