PTFE WITH LOADS

The advantages of filled PTFE compounds compared to uncharged resins are the properties of the filler formula, i.e. the properties of the added material. For example, the wear resistance may be more than 1,000 times greater than that of virgin PTFE. Other advantages include improving the initial deformation resistance and flowability, increasing stiffness and dimensional stability with temperature and a slight increase in hardness.

PTFE + Carbon Graphite

Usually used for chemical and mechanical applications. Graphite decreases initial wear and strengthens PTFE compound. PTFE + Graphite has high thermal conductivity and high wear resistance at high loads. Recommended for piston seals and other dynamic seals.

PTFE + Glass Fibre

It is the most used filler and the filler that modifies the least the PTFE chemical and electrical properties improving the mechanical characteristics in a unique way. It slightly increases the coefficient of friction as it considerably increases the wear resistance and at high loads. Recommended for structural parts and sealing balls.

PTFE + Bronze

Bronze fillers improve wear resistance characteristics of parts subjected to abrasion, combining low coefficient of friction with resistance to high loads. Using high percentages, we can obtain a product with good thermal conductivity and higher mechanical properties than the other compounds. This material is not recommended in electrical applications because it is not an electrical insulator. Recommended for sliding and rotating applications.

PTFE + Molybdenum Disulphide

It has the same resistance to high loads but uses MoS2 as a lubricant. Thanks to this filler, PTFE hardness, stiffness and wear resistance are considerably improved and its influence on thermal and electrical properties is almost non-existent.

THERMAL AND MECHANICAL PROPERTIES

PROPERTIES	RULES	UNITS	VIRGIN PTFE	PTFE +						
				GRAPHITE 15	CARBON 25	GLASS 15	GLASS 25	BRONZE 60	CARBON 22 GRAPHITE 3	GLASS 15 MOS_2 5
DENSITY	ISO 12086	g/cm^3	2.14-2.18	2.15-2.18	2.08-2.12	2.18-2.20	2.20-2.24	3.85-3.95	2.06-2.11	2.22-2.25
SHORE HARDNESS	DIN 53505	Sh. D	52-60	56-64	62-68	54-62	56-64	63-68	60-69	54-58
TENSILE STRENGTH (23°C)	DIN 53455	N / mm^2	25-42	12-19	13-15	17-21	15-19	11-15	11-15	14-18
DEFORMATION TO RUTURE (23°C)	DIN 53455	%	250-400	130-240	40-70	250-290	220-260	110-140	60-100	200-230
MODULUS OF ELASTICITY	DIN 53457	N / mm^2	400-800	720	1150	1000	950	-	1250	750
COMPRESSIVE STRESS AT 1% DEFORMATION (23°C)	DIN 53454	N / mm^2	4.3	7.3	14	6.9	8.2	13	11	6.9
COEFFICIENT OF THERMAL EXPANSION (20-150°C)	-	$1/K.10^{-5}$	12	10.5	9	10.5	10	9	8.5	10.2
COEFFICIENT OF THERMAL EXPANSION (150-260°C)	-	$1/K.10^{-5}$	16	13.9	12	13.6	13.4	12.3	11.6	13.5
THERMAL CONDUCTIVITY (23°C)	DIN 52612	W/K.m	0.23	0.52	0.6	0.39	0.46	0.77	0.54	0.35
DEFORMATION AFTER 24H AT 23°C - 4	ASTM D621	%	16	9	4	13.5	12.5	4.2	6.5	12
DEFORMATION AFTER 24H AT 23°C - 15	ASTM D621	%	7	3.6	1.6	5	4.8	2.8	2.1	5
PV LIMIT 3 m/min	-	$N/mm^2m/min$	2.5	21	-	20	23	21	32	25
PV LIMIT 30 m/min	-	$N/mm^2m/min$	3.9	26	-	23	25	27	32	28
PV LIMIT 300 m/min	-	$N/mm^2m/min$	5.5	27	-	30	31	28	35	32
COEFFICIENT OF STATIC STROKE	-	-	0.14	0.15	-	0.16	0.18	0.17	0.14	0.15
WEAR	-	$cm^3min/kg\ m\ h$	78	41	-	8.3	7.1	6.1	7	8.1

GENERAL USE PLASTICS

TECHNICAL DATASHEET

PROPERTIES	UNITS	PTFE + 25% CARBON	PTFE + 25% GLASS FIBER	PTFE + 60% BRONZE
DENSITY	g/cm^3	2.10	2.25	3.95
THERMAL PROPERTIES				
THERMCAL CONDUCTIVITY	cal/s/cm/°C	15×10^{-4}	9.5×10^{-4}	17×10^{-4}
COEFF. OF LINEAR THERMAL EXPANSION (23°C - 260°C)	°C	12×10^{-5}	15×10^{-5}	13×10^{-5}
MECHANICAL PROPERTIES				
TENSILE STRENGTH	MPa	>14	>13	>10
RUPTURE DEFORMATION	%	>150	>250	>100
SHORE HARDNESS	SHORE D	63	59	65
DYNAMIC FRICTION COEFFICIENT	-	0.25	0.30	0.25
FLUENCY	%	9	14	8
PRESSURE/VELOCITY FACTOR - P.V. (3.5m/min)	$kg/cm^2 \times m/s$	550	460	650
ELECTRICAL PROPERTIES				
VOLUME RESISTIVITY	Ohm x cm	10^3	10^{16}	10^8
SURFACE RESISTIVITY	Ohm	10^3	10^{16}	10^8