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UHMWPE (Ultra High Molecular Weight Polythene)

UHMWPE (Ultra high molecular weight Polythene) possesses properties that make it particularly suitable for use in very low temperature and dry sliding applications.

- Continuous service temperature range, under moderate loading, of -269˚C to 80˚C.
- Exceptional impact strength maintained at relatively high values even at very low temperatures.
- Very good fatigue strength under alternating stress.
- Low coefficient of friction.
- A “non stick” surface resistant to abrasion, to which very few substances can adhere, self lubricating especially in dry • movements against metal surfaces.
- Good electrical properties, especially at high frequencies, maintained over a wide temperature range.
- Resistant to attack by a wide range of chemicals.
- Almost no moisture absorption.
- Virtually odourless and tasteless, virgin compression moulded material is approved for contact with food (extruded material an grades intended for industrial applications are not, because of additives, approved for contact with food).
- Density of only 0.94 g/cm3.
- Easily machined.

AVAILABILITY - UHMWPE

- Extruded rod 12.5mm - 200mm diameter
- Compression moulded sheets
  virgin material 2mm - 140mm thick
  reclaimed grades 5mm - 140mm thick
- Coiled wear strips
- Machined Components

MECHANICAL PROPERTIES		Test Method	Natural	Units
Density		DIN 53479	0.94	g/cm^3
Yield Stress (Tensile Strength)		DIN 53455	22	N/mm^2
Ultimate Tensile Strength		DIN 53455	44	N/mm^2
Elongation at Break		DIN 53455	450	%
Limiting Flexural Stress		DIN 53452	27	N/mm^2
Torsional Stiffness	at 23˚C	DIN 53447	250	N/mm^2
	at -40˚C	DIN 53447	370	N/mm^2
Bend Creep Modulus 1 Min Value			790	N/mm^2
Ball Indentation Hardness 30 Sec Value		DIN 53456	38	N/mm^2
Shore Hardness D		DIN 53505	64 - 67	
Notched Impact Strength		DIN 53453	not broken	mJ/mm^2
Dynamic Coefficient of Friction on Polished and				
Hardened Steel	Dry		0.10 - 0.22	
	Lubricated by Water		0.05 - 0.10	
	Lubricated by Oil		0.05 - 0.08	
Abrasion by Abrader Wheel Method		DIN 53754	3 - 8	mm3/100 rev
THERMAL PROPERTIES				
Crystalline Melting Range			135 - 138	˚C
Average Coefficient of Linear				
Thermal Expansion between 20˚C and 100˚C		DIN 52328	$2\ 10^{-4}$	K^{-1}
Thermal Conductivity at 20˚C		DIN 52612	0.42	W/mK
Specific Heat at 20˚C			1.84	kJ/kg K
Heat Distortion Temperature Method A		ISO R75	95	˚C
Inflammability		not self extinguishing		
ELECTRICAL PROPERTIES				
Volume Resistivity		DIN 53482	$>10^{16}$	ohm cm
Surface Resistance		DIN 53482	$>10^{13}$	ohm
Dielectric Strength		DIN 53481	900	kV/cm
Dielectric Constant at $2\ 10^6$ Hz			2.30	
Tracking Resistance		DIN 53480	KA3c	
Arc Resistance		DIN 53484	L4	
Dielectric Loss Factor	at 50 Hz	DIN 53483	$1.9\ 10^{-4}$	
	at 10^3 Hz	DIN 53483	$0.5\ 10^{-4}$	
	at 10^4 Hz	DIN 53483	$0.5\ 10^{-4}$	
	at 10^5 Hz	DIN 53483	$2.5\ 10^{-4}$	