Plaztuff™ HYSPEC™ Polymer Sheet

"Built to your requirement for your environment"

Plaztuff™ Hyspec Polymer sheet is a modified High Molecular Weight Polyethylene (HMWPE) made to our exact specification for the purposes of manufacturing a wide range of engineering products using extrusion welding and sheet fabrication techniques

Polyethylene's are semi-crystalline materials with excellent chemical resistance#, good fatigue and wear resistance, and a wide range of properties. Polyethylenes provide good resistance to organic solvents, degreasing agents and electrolytic attack. They have higher impact strength, but lower working temperatures than Polypropylene. They are light in weight, resistant to staining and have very low moisture absorption rates. Polyethylenes are easy to distinguish from other plastics as they float in water.

Plaztuff ™ HMWPE is lightweight (1/8 the weight of mild steel), high in tensile strength and is as simple to machine as wood and with extrusion welding equipment is fully weldable. Plaztuff™ is self-lubricating, offers excellent impact resistant, long wearing, has moderate abrasion resistant and is corrosion resistant. Plaztuff™ sheet is built to a high specification with a very high UV factor and performs well in all environments with good weathering properties and a 20+ UV life. Plaztuff™ is also non-toxic and non-staining and meets FDA and USDA certification acceptance for food and pharmaceutical equipment and is a good performer in applications up to 82°c

FOOD GRADE

Plaztuff™ Hyspec Polymer meet the following specification:
ASTM D4976 – PE 235
FDA 21 CFR 177.1520(c) 3.2a use conditions B through H
UL94HB yellow card per UL file E54700
NSF Standards 14 and 61 for potable water

Material Properties

Property	SI	Method
PHYSICAL		(ASTM or UL)
Molecular Weight	< 500,000	
Density	0.96 g/cm3	ASTM D1505
Water Absorption, 24hrs %	0	ASTM D570
MECHANICAL		
Tensile Strength at Yield, 2 in/min, Type IV bar	28 MPa	ASTM D638
Tensile Impact, Type S bar	190 kJ/m2	ASTM D1822
Elongation at Break, 2 in/min, Type IV bar	500%	ASTM D638
Flexural Modulus, Tangent - 16:1 span:depth, 0.5 in/min	1,400 MPa	ASTM D790
ESCR, Condition A (100% Igepal), F50	>600 h	ASTM D1693

ESCR, Condition B (100% Igepal), F50	>600 h	ASTM D1693
Durometer Hardness, Type D (Shore D)	77	ASTM D2240
Dynamic Coefficient of friction	0.07	ASTM D1894

Wear resistance

Each material listed below was rotated 24 hours @ 1750 r.p.m. in a 50/50 sand/water slurry. The weight loss for each of the materials is relative to100 and so...

The lower the number... the better the abrasion resistance.

Material	Abrasion Rating
Carbon Steel	100
High MW Polyethylene	44
Nylon	31

THERMAL

Vicat Softening Temperature, Loading 1, Rate A	126°C	ASTM D1525
Heat Deflection Temperature, 66 psi, Method A	78°C	ASTM D648
Brittleness Temperature, Type A, Type I specimen	<-75°C	ASTM D746
Average Coefficient of linear Thermal Expansion between 23 & 100°c 10^{-6} m/(m-K)	150	ASTM D696\
Max operating Temperature	82°C	-
Flammability Rating	n.r	UL94

ELECTRICAL

Dielectric Strength (V/mil) short time, 5mm thick	700	ASTM D149
Dielectric Constant at 1 kHz	2.30-2.35	ASTM D150
Dissipation Factor at 1 kHz	0.0002	ASTM D150
Volume Resistivity (ohm-cm) at 50% RH	10^{15}	ASTM D257
Arc Resistance (sec)	250-300	ASTM D495

The nominal properties reported herein are typical of the product, but do not reflect normal testing variance and therefore should not be used for specification purposes. Values are rounded. The physical properties determined on test pieces cannot be used for concluding the behaviour of finished articles, since the range of variables in both the processing and shaping play a part.

see attached chemical resistance chart for polyethylene