Goodfellow Polyethylene Naphthalate (PEN) Film

Category : Polymer , Film , Thermoplastic , Polyester, TP

Material Notes:

A polyester that is chemically quite similar to PET but which is more temperature resistant. So far available only as biaxially oriented and heat stabilized films, they are semi-crystalline and colorless, either crystal clear or slightly hazy (the latter are available from Goodfellow stock). Compared to their PET equivalents, they start to shrink significantly at 190C rather than 150C and are certified for long term electrical use at 155C rather than 105/130C. Their tensile strengths are similar, but the modulus of PEN films is higher - say 25% at ambient temperatures but several times higher in the 100-150C region. They also have better UV resistance and barrier properties and are more resistant to hydrolysis in alkaline or very hot aqueous conditions. They are, however, more expensive and have a lower flex life.Applications for the films are mainly in the electrical and electronic areas.Information provided by Goodfellow.

Order this product through the following link:
http://www.lookpolymers.com/polymer_Goodfellow-Polyethylene-Naphthalate-PEN-Film.php

Physical Properties	Metric	English	Comments
Density	1.36 g/cc	0.0491 lb/in³	

Mechanical Properties	Metric	English	Comments
Tensile Strength at Break	200 MPa	29000 psi	biax film
Elongation at Break	60 %	60 %	biax film
Tensile Modulus	5.00 - 5.50 GPa	725 - 798 ksi	biax film
Coefficient of Friction	0.27	0.27	biax film

Thermal Properties	Metric	English	Comments
CTE, linear	20.0 - 21.0 µm/m-°C @Temperature 20.0 °C	11.1 - 11.7 µin/in-°F @Temperature 68.0 °F	biax film
Maximum Service Temperature, Air	155 °C	311 °F	
Flammability, UL94	V-2	V-2	
Shrinkage	0.800 % @Temperature 190 °C, Time 300 sec	0.800 % @Temperature 374 °F, Time 0.0833 hour	

Optical Properties	Metric	English	Comments
Transmission, Visible	84 % @Thickness 0.0750 mm	84 % @Thickness 0.00295 in	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	1.00e+15 ohm-cm	1.00e+15 ohm-cm	
Surface Resistivity per Square	1.00e+14 ohm	1.00e+14 ohm	
Dielectric Constant	3.2 @Frequency 10000 Hz	3.2 @Frequency 10000 Hz	
Dielectric Strength	160 kV/mm	4060 kV/in	at 0.075 mm
Dissipation Factor	0.0048 @Frequency 10000 Hz	0.0048 @Frequency 10000 Hz	

Descriptive Properties	Value	Comments
Chemical Resistance - Alcohols	Good	
Chemical Resistance - Alkalis	Good	
Chemical Resistance - Aromatics	Good	
Chemical Resistance - Concentrated Acids	Good-Poor	
Chemical Resistance - Dilute Acids	Good	
Chemical Resistance - Greases and Oils	Good	
Chemical Resistance - Halogens	Good	
Chemical Resistance - Ketones	Good	
Permeability to Carbon Dioxide @25°C	0.01 x 10^{-13} cm^3.cm cm^{-2} s^{-1} Pa^{-1}; (film)	
Permeability to Oxygen @25°C	0.006 x 10^{-13} cm^3.cm cm^{-2} s^{-1} Pa^{-1}; (film)	
Permeability to Water @25°C	40 x 10^{-13} cm^3.cm cm^{-2} s^{-1} Pa^{-1}; (film)	

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