

Film Type Teonex® Q51
Product Description

Teonex™ is biaxially oriented polyethylene naphthalate (PEN) films.

Q51 is slightly hazy film with excellent handling properties for general purpose.

Thickness range: 12-250microns

Typical Values for Major Properties

Property	Values (25microns)				Test	
	Values	Units	SI Values	SI Units		
General						
Density		1.36	g/cm3	-	-	JIS C-2151
Refractive Index	nx	1.759				TDF Method
	ny	1.757				
	nz	1.499				
Mechanical						
Young Modulus	MD	620	kg/mm2	6080	N/mm2	ASTM D882-67 (Modified to TDF)
	TD	620		6080		
F-5 Value	MD	14	kg/mm2	135	N/mm2	TDF Method
	TD	14		135		
Tensile Strength	MD	28	kg/mm2	275	N/mm2	JIS C-2318 (Modified to TDF)
	TD	27		265		
Elongation to break	MD	90	%	-	-	JIS C-2318 (Modified to TDF)
	TD	85		-	-	
Tear Propagation Resistance	MD	0.6	kg/mm2	6	N/mm2	JIS-P8116
	TD	0.6		6		
Tear Initiation Resistance	MD	18	kg/20mm	175	N-mm/mm2	JIS C-2318
	TD	18		175		
Impact Strength	MD	65	kg.mm/mm2	635	10 ⁻⁶ N	ASTM D1822-61T
	TD	50		490		
Loop Stiffness	MD	1.7	mg	-	-	TDF Method
	TD	1.8		-	-	
Thermal						
Melting Points		269	degree C	-	-	DSC
Glass Transition Temperature		121	degree C	-	-	DSC
Shrinkage (150 degree C, 30mir)	MD	0.4	%	-	-	JIS C-2318 (Modified to TDF)
	TD	0		-	-	
Shrinkage (200 degree C, 10mir)	MD	2	%	-	-	TDF Method
	TD	1		-	-	
Co-efficient of Thermal Expansion	MD	13	10 ⁻⁶ /degree C	-	-	TDF Method
Co-efficient of Hydrolytic Expansion	MD	11	10 ⁻⁶ /RH%	-	-	TDF Method
Continuous Use Temp.						UL 746B
Mechanical		160 (25-250mic)				
Electrical		180 (25-250mic)				

Typical Values for Major Properties

Property	Values (25microns)		SI Values	SI Units	Test
	Values	Units			
Chemical					
Moisture Absorption	0.3	%	-	-	TDF Method
Water Vapor Permeability	6.7	g/m ² .24hrs	-	-	JIS-Z0208
Gas Permeability CO ₂	3.7	10 ⁻¹² cc.cm/cm ² .sec.cmHg			ASTM D1434-63
O ₂	0.8				
Electrical					
Break Down Voltage	300	KV/mm			JIS C-2318
Permittivity (25 degree C)	60Hz	3.0			JIS C-2318
	1KHz	2.9			
	1GHz	2.9			
Dissipation Factor (25 degree C)	60Hz	0.003	Tan Delta		JIS C-2318
	1KHz	0.005			
	1GHz	0.005			
Surface Resistivity (25 degree C)	2	10 ¹⁷ Ohm			JIS C-2151
Volume Resistivity (25 degree C)	10	10 ¹⁷ Ohm			JIS C-2318
Optical					
UV Light Permeability at 360nm	8	%			TDF Method
TLT	82	%			JIS K6714
Haze	14	%			JIS K6714
Surface					
Surface Roughness Ra	Inside	13	nm		TDF Method
	Outside	11			
Co-efficient of Slip	Static	0.3			JIS C-2151
	Dynamic	0.3			
Wettability Water Angle	70	degree			TDF Method

MD: Machine Direction
 TD: Transverse Direction

These values are typical performance data for Teonex™ PEN film; they are not intended to be used as design data. We believe this information is the best currently available on the subject. It is offered as a possible helpful suggestion in experimentation you may care to undertake along these lines. It is subject to revision as additional knowledge and experience is gained. Teijin DuPont Films makes no guarantee of results and assumes no obligation or liability whatsoever in connection with this information. This publication is not a license to operate under, or intended to suggest infringement of, any existing patents.

CAUTION: Do not use in medical applications involving permanent implantation in the human body. For other medical applications, see "DuPont Medical Caution Statement," H-50102.

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