

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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