

NatureWorks® 4043D

Ingeo 4043D can be converted into a biaxially oriented film with use temperatures up to 265°F (130°C). This film has excellent optics, good machinability and excellent twist and deadfold. These properties make 4043D film an ideal candidate for candy twist wrap and other packaging applications. Additional properties include advantageous barrier to flavor and grease and superior oil resistance.

Physical Properties	Metric	English	Comments
Specific Gravity	1.24 g/cc	1.24 g/cc	ASTM D1505
Moisture Vapor Transmission	13.8 - 15.7 cc-mm/m ² -24hr-atm	35.1 - 39.9 cc-mil/100 in ² -24hr-atm	ASTM F1249
Oxygen Transmission	25.6 - 27.6 cc-mm/m ² -24hr-atm	65.0 - 70.1 cc-mil/100 in ² -24hr-atm	ASTM D3985
Carbon Dioxide Transmission	106 - 118 cc-mm/m ² -24hr-atm	269 - 300 cc-mil/100 in ² -24hr-atm	NatureWorks test
Viscosity Measurement	4.0 @Temperature 30.0 °C	4.0 @Temperature 86.0 °F	Relative viscosity; 1.0 g/dl chloroform

Melt Flow	6.0 g/10 min @Load 2.16 kg, Temperature 210 °C	6.0 g/10 min @Load 4.76 lb, Temperature 410 °F
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Mechanical Properties	Metric	English	Comments
Film Elongation at Break, MD	160 %	160 %	ASTM D882
Film Elongation at Break, TD	100 %	100 %	ASTM D882
Secant Modulus, MD	3.30 GPa	479 ksi	ASTM D882
Secant Modulus, TD	3.900 GPa	565.7 ksi	ASTM D882
Elmendorf Tear Strength, MD	0.591 g/micron	15.0 g/mil	ASTM D1922
Elmendorf Tear Strength, TD	0.512 g/micron	13.0 g/mil	ASTM D1922
Film Tensile Strength at Break, MD	110 MPa	16000 psi	ASTM D882
Film Tensile Strength at Break, TD	145 MPa	21000 psi	ASTM D882

Thermal Properties	Metric	English	Comments
Melting Point	145 - 160 °C	293 - 320 °F	ASTM D3418
Maximum Service Temperature, Air	130 °C	266 °F	

Optical Properties	Metric	English	Comments
Haze	2.1 %	2.1 %	ASTM D1003
Gloss	90 %	90 %	20°; ASTM D1003

Processing Properties	Metric	English	Comments
Feed Temperature	180 °C	356 °F	
Adapter Temperature	200 °C	392 °F	
Die Temperature	200 °C	392 °F	
Melt Temperature	202 - 218 °C	396 - 424 °F	
Screw Speed	20 - 100 rpm	20 - 100 rpm	