



# DOW™ LDPE 5004I

## Low Density Polyethylene Resin

### Overview

Dow LDPE 5004I is used for fresh milk cartons, liquid/juice containers, dry foods packaging, snack foods packaging, moist foods packaging, and medical packaging. Dow LDPE extrusion coating resins provide optimal neck-in and draw-down performance with minimal taste/odor contribution.

- A low melt index coating resin for demanding packaging applications

Complies with:

- U.S. FDA 21 CFR 177.1520 (c) 2.2
- U.S. FDA -DMF
- Canadian HPFB No Objection (With Limitations)
- EU, No 10/2011
- Japan Hygienic Olefin and Styrene Plastics Association

Consult the regulations for complete details.

### Additive

- Antiblock: No
- Slip: No
- Processing Aid: No

Physical	Nominal Value (English)	Nominal Value (SI)	Test Method
Density	0.924 g/cm <sup>3</sup>	0.924 g/cm <sup>3</sup>	ASTM D792
Base Density <sup>1</sup>	0.924 g/cm <sup>3</sup>	0.924 g/cm <sup>3</sup>	Dow Method
Melt Index (190°C/2.16 kg)	4.2 g/10 min	4.2 g/10 min	ASTM D1238
Mechanical	Nominal Value (English)	Nominal Value (SI)	Test Method
Coefficient of Friction <sup>2</sup> vs. Itself - Dynamic, Extrusion Coating	0.45	0.45	ASTM D1894
Films	Nominal Value (English)	Nominal Value (SI)	Test Method
Film Thickness - Tested	1 mil	25 µm	
Film Puncture Resistance 1.0 mil (25 µm), Cast Film	28.0 ft·lb/in <sup>3</sup>	2.32 J/cm <sup>3</sup>	Dow Method
Film Toughness			ASTM D882
MD : 1.0 mil (25 µm), Cast Film	1370 ft·lb/in <sup>3</sup>	114 J/cm <sup>3</sup>	
TD : 1.0 mil (25 µm), Cast Film	1750 ft·lb/in <sup>3</sup>	145 J/cm <sup>3</sup>	
Tensile Strength			ASTM D882
MD : Yield, 1.0 mil (25 µm), Cast Film	2140 psi	14.8 MPa	
TD : Yield, 1.0 mil (25 µm), Cast Film	1580 psi	10.9 MPa	
MD : Break, 1.0 mil (25 µm), Cast Film	4500 psi	31.0 MPa	
TD : Break, 1.0 mil (25 µm), Cast Film	2470 psi	17.0 MPa	
Tensile Elongation			ASTM D882
MD : Break, 1.0 mil (25 µm), Cast Film	220 %	220 %	
TD : Break, 1.0 mil (25 µm), Cast Film	610 %	610 %	
Dart Drop Impact			ASTM D1709A
1.0 mil (25 µm), Cast Film	27 g	27 g	
Elmendorf Tear Strength			ASTM D1922
MD : 1.0 mil (25 µm), Cast Film	310 g	310 g	
TD : 1.0 mil (25 µm), Cast Film	80 g	80 g	
Seal Initiation Temperature <sup>3</sup> 1.0 mil (25 µm), Extrusion Coating	221 °F	105 °C	
Water Vapor Transmission Rate <sup>3</sup> 1.0 mil (25 µm), Extrusion Coating	1.5 g·mil/100in <sup>2</sup> /a tm/24 hr	0.59 g·mm/m <sup>2</sup> /atm /24 hr	ASTM F1249
Thermal	Nominal Value (English)	Nominal Value (SI)	Test Method
Vicat Softening Temperature	203 °F	95.0 °C	ASTM D1525

<b>Thermal</b>	<b>Nominal Value (English)</b>	<b>Nominal Value (SI)</b>	<b>Test Method</b>
Melting Temperature (DSC)	234 °F	112 °C	Dow Method
<b>Optical</b>	<b>Nominal Value (English)</b>	<b>Nominal Value (SI)</b>	<b>Test Method</b>
Gloss (45°, 1.00 mil (25.4 µm), Cast Film)	51	51	ASTM D2457
Haze (1.00 mil (25.4 µm), Cast Film)	12.9 %	12.9 %	ASTM D1003
<b>Extrusion</b>	<b>Nominal Value (English)</b>	<b>Nominal Value (SI)</b>	<b>Test Method</b>
Melt Temperature	600 to 620 °F	316 to 327 °C	
Maximum Line Speed	25.0 ft/sec	7.6 m/sec	Dow Method
Minimum Coating Thickness	0.30 mil	7.6 µm	Dow Method
Minimum Coating Weight	4.4 lb/ream	7.2 g/m <sup>2</sup>	Dow Method
Neck-in (610°F (321°C), 1.0 mil (25.4 µm))	2.5 in	63.5 mm	Dow Method

#### **Extrusion Notes**

##### Fabrication Conditions For Cast Film:

- Screw A, Size: 2 in. (51 mm); 30:1 L/D
  - Melt Temperature: 502°F (261°C)
  - Screw Speed: 33 rpm
- Screw B, Size: 2.5 in. (63.5 mm); 30:1 L/D
  - Melt Temperature: 501°F (261°C)
  - Screw Speed: 33 rpm
- Screw C, Size: 2.5 in. (63.5 mm); 30:1 L/D
  - Melt Temperature: 499°F (259°C)
  - Screw Speed: 33 rpm
- Screw D, Size: 2.5 in. (63.5 mm); 30:1 L/D
  - Melt Temperature: 500°F (260°C)
  - Screw Speed: 33 rpm
- Screw E, Size: 2 in. (51 mm); 30:1 L/D
  - Melt Temperature: 501°F (261°C)
  - Screw Speed: 33 rpm
- Screw Type: DSB II
- Chill Roll Temperature: 70°F (21°C)
- Line Speed: 400 fpm (123 m/min)

##### Fabrication Conditions For Extrusion Coating Film:

- Screw Size: 3.5 in. (89 mm) 30:1 L/D
- Screw Type: Single Flight with Maddock Mixer
- Die Gap: 20 mil (0.508 mm)
- Melt Temperature: 625°F (329°C)
- Output: 250 lb/hr
- Screw Speed: 90 rpm
- Gauge: 1.0 mil (25 µm)

#### **Notes**

These are typical properties only and are not to be construed as specifications. Users should confirm results by their own tests.

<sup>1</sup> Base density is estimated using the assumption that every 1000 ppm of antiblock in the finished product raises the density of the polymer by 0.0006 g/cm<sup>3</sup>. Base density is the estimated density of the polymer if it did not contain any antiblock.

<sup>2</sup> 1.0 mil (25µm) coating onto 50 lb Kraft paper.

<sup>3</sup> Coating onto 50# Kraft paper.

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