



# DOW™ LDPE 640I

## Low Density Polyethylene Resin

### Overview

DOW Polyethylene 640I Low Density is a general purpose liner resin for thin gauge applications requiring good drawdown and excellent toughness.

- Low Density Polyethylene (LDPE)
- A barefoot general purpose general liner resin
- For blown and cast film extrusion
- Optimum gauge range: 0.8-3.0 mil

Complies with:

- U.S. FDA 21 CFR 177.1520 (c) 2.2.
- U.S. FDA -DMF
- EU, No 10/2011
- Canadian HPFB No Objection (With Limitations)

Consult the regulations for complete details.

### Additive

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

| Physical                                                     | Nominal Value (English)    | Nominal Value (SI)      | Test Method |
|--------------------------------------------------------------|----------------------------|-------------------------|-------------|
| Density                                                      | 0.920 g/cm <sup>3</sup>    | 0.920 g/cm <sup>3</sup> | ASTM D792   |
| Base Density <sup>1</sup>                                    | 0.920 g/cm <sup>3</sup>    | 0.920 g/cm <sup>3</sup> | Dow Method  |
| Melt Index (190°C/2.16 kg)                                   | 2.0 g/10 min               | 2.0 g/10 min            | ASTM D1238  |
| Environmental Stress-Cracking Resistance (ESCR) <sup>2</sup> | 2.00 hr                    | 2.00 hr                 | ASTM D1693  |
| Mechanical                                                   | Nominal Value (English)    | Nominal Value (SI)      | Test Method |
| Tensile Strength <sup>2</sup>                                |                            |                         | ASTM D638   |
| Yield                                                        | 1300 psi                   | 8.96 MPa                |             |
| Break                                                        | 1600 psi                   | 11.0 MPa                |             |
| Tensile Elongation <sup>2</sup>                              |                            |                         | ASTM D638   |
| Yield                                                        | 4.0 %                      | 4.0 %                   |             |
| Break                                                        | 600 %                      | 600 %                   |             |
| Flexural Modulus - 2% Secant <sup>2</sup>                    | 34000 psi                  | 234 MPa                 | ASTM D790   |
| Films                                                        | Nominal Value (English)    | Nominal Value (SI)      | Test Method |
| Film Puncture Resistance                                     |                            |                         | Dow Method  |
| 1.0 mil (25 µm), Cast Film                                   | 45.0 ft·lb/in <sup>3</sup> | 3.72 J/cm <sup>3</sup>  |             |
| 2.0 mil (51 µm), Blown Film                                  | 35.0 ft·lb/in <sup>3</sup> | 2.90 J/cm <sup>3</sup>  |             |
| Film Toughness                                               |                            |                         | ASTM D882   |
| MD : 1.0 mil (25 µm), Cast Film                              | 1790 ft·lb/in <sup>3</sup> | 148 J/cm <sup>3</sup>   |             |
| MD : 2.0 mil (51 µm), Blown Film                             | 1920 ft·lb/in <sup>3</sup> | 159 J/cm <sup>3</sup>   |             |
| TD : 1.0 mil (25 µm), Cast Film                              | 2310 ft·lb/in <sup>3</sup> | 191 J/cm <sup>3</sup>   |             |
| TD : 2.0 mil (51 µm), Blown Film                             | 2230 ft·lb/in <sup>3</sup> | 184 J/cm <sup>3</sup>   |             |
| Secant Modulus                                               |                            |                         | ASTM D882   |
| 2% Secant, MD : 2.0 mil (51 µm), Blown Film                  | 26200 psi                  | 181 MPa                 |             |
| 2% Secant, TD : 2.0 mil (51 µm), Blown Film                  | 30000 psi                  | 207 MPa                 |             |

| <b>Films</b>                                   | <b>Nominal Value (English)</b> | <b>Nominal Value (SI)</b> | <b>Test Method</b> |
|------------------------------------------------|--------------------------------|---------------------------|--------------------|
| <b>Tensile Strength</b>                        |                                |                           | ASTM D882          |
| MD : Yield, 1.0 mil (25 µm), Cast Film         | 1850 psi                       | 12.7 MPa                  |                    |
| MD : Yield, 2.0 mil (51 µm), Blown Film        | 1790 psi                       | 12.3 MPa                  |                    |
| TD : Yield, 1.0 mil (25 µm), Cast Film         | 1460 psi                       | 10.0 MPa                  |                    |
| TD : Yield, 2.0 mil (51 µm), Blown Film        | 1760 psi                       | 12.1 MPa                  |                    |
| MD : Break, 1.0 mil (25 µm), Cast Film         | 4970 psi                       | 34.3 MPa                  |                    |
| MD : Break, 2.0 mil (51 µm), Blown Film        | 3600 psi                       | 24.8 MPa                  |                    |
| TD : Break, 1.0 mil (25 µm), Cast Film         | 3240 psi                       | 22.3 MPa                  |                    |
| TD : Break, 2.0 mil (51 µm), Blown Film        | 3330 psi                       | 23.0 MPa                  |                    |
| <b>Tensile Elongation</b>                      |                                |                           | ASTM D882          |
| MD : Break, 1.0 mil (25 µm), Cast Film         | 260 %                          | 260 %                     |                    |
| MD : Break, 2.0 mil (51 µm), Blown Film        | 420 %                          | 420 %                     |                    |
| TD : Break, 1.0 mil (25 µm), Cast Film         | 700 %                          | 700 %                     |                    |
| TD : Break, 2.0 mil (51 µm), Blown Film        | 670 %                          | 670 %                     |                    |
| <b>Dart Drop Impact</b>                        |                                |                           | ASTM D1709A        |
| 1.0 mil (25 µm), Cast Film                     | 45 g                           | 45 g                      |                    |
| 2.0 mil (51 µm), Blown Film                    | 150 g                          | 150 g                     |                    |
| <b>Elmendorf Tear Strength</b>                 |                                |                           | ASTM D1922         |
| MD : 1.0 mil (25 µm), Cast Film                | 190 g                          | 190 g                     |                    |
| MD : 2.0 mil (51 µm), Blown Film               | 500 g                          | 500 g                     |                    |
| TD : 1.0 mil (25 µm), Cast Film                | 130 g                          | 130 g                     |                    |
| TD : 2.0 mil (51 µm), Blown Film               | 280 g                          | 280 g                     |                    |
| <b>Impact</b>                                  | <b>Nominal Value (English)</b> | <b>Nominal Value (SI)</b> | <b>Test Method</b> |
| Tensile Impact Strength <sup>3, 2</sup>        | 70.0 ft-lb/in <sup>2</sup>     | 147 kJ/m <sup>2</sup>     | ASTM D1822         |
| <b>Hardness</b>                                | <b>Nominal Value (English)</b> | <b>Nominal Value (SI)</b> | <b>Test Method</b> |
| Durometer Hardness <sup>2</sup> (Shore D)      | 45                             | 45                        | ASTM D2240         |
| <b>Thermal</b>                                 | <b>Nominal Value (English)</b> | <b>Nominal Value (SI)</b> | <b>Test Method</b> |
| Deflection Temperature Under Load <sup>2</sup> |                                |                           | ASTM D648          |
| 66 psi (0.45 MPa), Unannealed                  | 101 °F                         | 38.3 °C                   |                    |
| Brittleness Temperature <sup>2</sup>           | < -105 °F                      | < -76.1 °C                | ASTM D746          |
| Vicat Softening Temperature                    | 203 °F                         | 95.0 °C                   | ASTM D1525         |
| Melting Temperature (DSC)                      | 233 °F                         | 112 °C                    | Dow Method         |
| Peak Crystallization Temperature (DSC)         | 209 °F                         | 98.3 °C                   | Dow Method         |
| <b>Optical</b>                                 | <b>Nominal Value (English)</b> | <b>Nominal Value (SI)</b> | <b>Test Method</b> |
| Gloss                                          |                                |                           | ASTM D2457         |
| 45°, 2.00 mil (50.8 µm), Blown Film            | 66                             | 66                        |                    |
| 45°, 1.00 mil (25.4 µm), Cast Film             | 75                             | 75                        |                    |
| Haze                                           |                                |                           | ASTM D1003         |
| 2.00 mil (50.8 µm), Blown Film                 | 7.60 %                         | 7.60 %                    |                    |
| 1.00 mil (25.4 µm), Cast Film                  | 4.80 %                         | 4.80 %                    |                    |

---

## Extrusion Notes

---

### Fabrication Conditions For Cast Film:

- Screw A, Size: 2 in. (51 mm); 30:1 L/D
  - Melt Temperature: 501°F (261°C)
  - Screw Speed: 32 rpm
- Screw B, Size: 2.5 in. (63.5 mm); 30:1 L/D
  - Melt Temperature: 501°F (261°C)
  - Screw Speed: 32 rpm
- Screw C, Size: 2.5 in. (63.5 mm); 30:1 L/D
  - Melt Temperature: 501°F (261°C)
  - Screw Speed: 32 rpm
- Screw D, Size: 2.5 in. (63.5 mm); 30:1 L/D
  - Melt Temperature: 501°F (261°C)
  - Screw Speed: 32 rpm
- Screw E, Size: 2 in. (51 mm); 30:1 L/D
  - Melt Temperature: 501°F (261°C)
  - Screw Speed: 32 rpm
- Screw Type: DSB II
- Chill Roll Temperature: 70°F (21°C)
- Line Speed: 400 fpm (123 m/min)

### Fabrication Conditions For Blown Film:

- Screw Size: 2.5 in. (63.5 mm) 30:1 L/D
- Screw Type: Single Flight Double Mix
- Die Gap: 40 mil (1.02 mm)
- Melt Temperature: 390°F (199°C)
- Output: 7 lb/hr/in. of die circumference
- Die Diameter: 6 in.
- Blow-Up Ratio: 2.5:1
- Screw Speed: 60 rpm
- Frost Line Height: 25 in. (635 mm)

## 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> Plaque molded and tested in accordance with ASTM D4976.

---

<sup>3</sup> Type S

## Product Stewardship

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products - from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

## Customer Notice

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow.

## Medical Applications Policy

Any and all medical application use of Dow materials, whether a device, a component, or any type of primary or secondary packaging of a medically related object or substance, needs to be reviewed and approved by Dow before any Dow material can be tested in such application.

Dow requests that customers considering use of Dow products in medical applications notify Dow so that appropriate assessments may be conducted. Dow does not endorse or claim suitability of its products for specific medical applications. It is the responsibility of the medical device or pharmaceutical manufacturer to determine that the Dow product is safe, lawful, and technically suitable for the intended use. **DOW MAKES NO WARRANTIES, EXPRESS OR IMPLIED, CONCERNING THE SUITABILITY OF ANY DOW PRODUCT FOR USE IN MEDICAL APPLICATIONS.**

For further information contact your Dow sales or technical representative to request a Medical Application Review Request Form.

Additional details of Dow's Medical Applications Policy are available at: <https://www.dow.com/en-us/support/product-safety.html>

## Tobacco and Marijuana Policy

Dow does not support or intend for its products to be used, directly or indirectly, in the production of tobacco, the manufacture of tobacco products, the manufacture and use of electronic cigarettes (including vaping devices), the production of marijuana, or the manufacture of marijuana products intended for human consumption, where the Dow product (or its residues) may be present in the finished product or be alleged to facilitate the delivery of nicotine, other tobacco components, marijuana, or marijuana components.

## Harmful Applications Policy

Dow does not intend for its products to be used in applications specifically intended to harm humans.

## Disclaimer

NOTICE: No freedom from infringement of any patent owned by Dow or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, the Customer is responsible for determining whether products and the information in this document are appropriate for the Customer's use and for ensuring that the Customer's workplace and disposal practices are in compliance with applicable laws and other governmental enactments. Dow assumes no obligation or liability for the information in this document. **NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.**

NOTICE: If products are described as "experimental" or "developmental": (1) product specifications may not be fully determined; (2) analysis of hazards and caution in handling and use are required; (3) there is greater potential for Dow to change specifications and/or discontinue production; and (4) although Dow may from time to time provide samples of such products, Dow is not obligated to supply or otherwise commercialize such products for any use or application whatsoever.

NOTICE: This data is based on information Dow believes to be reliable, as demonstrated in controlled laboratory testing. They are offered in good faith, but without guarantee, as conditions and method of use of Dow products are beyond Dow's control. Dow recommends that the prospective user determine the suitability of these materials and suggestions before adopting them on a commercial scale.

To the best of our knowledge, the information contained herein is accurate and reliable as of the date of publication, however we do not assume any liability for the accuracy and completeness of such information.

For additional information, not covered by the content of this document, contact us via our web site [http://www.dow.com/products\\_services/](http://www.dow.com/products_services/).

## Additional Information

### North America

U.S. & Canada:

1-800-441-4369

1-989-832-1426

Mexico:

+1-800-441-4369

### Europe/Middle East

+800-3694-6367

+31-11567-2626

Italy:

+800-783-825

### Latin America

Argentina:

+54-11-4319-0100

Brazil:

+55-11-5188-9000

Colombia:

+57-1-219-6000

Mexico:

+52-55-5201-4700

### South Africa

+800-99-5078

### Asia Pacific

+800-7776-7776

+603-7965-5392

[www.dow.com](http://www.dow.com)

This document is intended for use within Asia Pacific, Latin America, North America

Published: 2000-11-30

© 2023 The Dow Chemical Company

