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Chemical Production Co.Ltd

Technical Data Sheet (TDS)

Low Density Polyethylene (LDPE)

Product Name: Low Density Polyethylene (LDPE)
Chemical Name: Polyethylene
CAS Number: 9002-88-4
Polymer Type: Low Density Polyethylene
Appearance: Natural/translucent pellets or granules
Grade: General Purpose LDPE
Revision Date: 17 June 2026

1. Product Description

Low Density Polyethylene (LDPE) is a thermoplastic polymer produced from ethylene monomer through high-pressure polymerization. LDPE offers excellent flexibility, toughness, chemical resistance, processability, and electrical insulation properties. It is widely used in film extrusion, injection molding, extrusion coating, and various packaging applications.

2. Key Features

- Excellent flexibility and toughness
- Good impact resistance
- High elongation at break
- Good moisture barrier properties
- Excellent electrical insulation characteristics
- Easy processing and fabrication
- Good chemical resistance
- Low water absorption
- Food-contact compliant grades available
- Recyclable material

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3. Typical Applications

Packaging

- Shopping bags
- Garbage bags
- Industrial liners
- Shrink films
- Stretch films
- Food packaging films

Extrusion Coating

- Paper coating
- Carton coating
- Flexible packaging laminates

Injection Molding

- Caps and closures
- Household products
- Flexible containers
- Toys

Extrusion

- Tubing
- Wire and cable insulation
- Sheets
- Profiles

Blow Molding

- Squeeze bottles
- Small containers
- Industrial packaging

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4. Typical Physical Properties

Property	Test Method	Typical Value
Density	ASTM D1505	0.918 – 0.930 g/cm³
Melt Flow Index (190°C/2.16 kg)	ASTM D1238	0.2 – 20 g/10 min
Water Absorption (24 hr)	ASTM D570	<0.01%
Refractive Index	ASTM D542	1.51
Vicat Softening Temperature	ASTM D1525	85 – 95°C
Melting Point	ASTM D3418	105 – 115°C
Crystallinity	ASTM D3418	40 – 55%

5. Typical Mechanical Properties

Property	Test Method	Typical Value
Tensile Strength at Yield	ASTM D638	8 – 15 MPa
Tensile Strength at Break	ASTM D638	10 – 25 MPa
Elongation at Break	ASTM D638	100 – 800%
Flexural Modulus	ASTM D790	150 – 300 MPa
Shore D Hardness	ASTM D2240	40 – 55
Izod Impact Strength	ASTM D256	No Break (typical)
Tear Resistance	ASTM D1004	Excellent

6. Typical Thermal Properties

Property	Test Method	Typical Value
Melting Temperature	ASTM D3418	105 – 115°C
Heat Deflection Temperature (0.455 MPa)	ASTM D648	35 – 50°C
Brittleness Temperature	ASTM D746	Below -60°C
Continuous Service Temperature	Internal	Up to 80°C
Thermal Conductivity	ASTM C177	0.33 W/m·K
Coefficient of Thermal Expansion	ASTM D696	1.8 – 2.2 × 10^{-4}/°C

7. Electrical Properties

Property	Test Method	Typical Value
Dielectric Strength	ASTM D149	20 – 35 kV/mm
Dielectric Constant (1 MHz)	ASTM D150	2.2 – 2.4
Volume Resistivity	ASTM D257	$>10^{16}$ Ω·cm
Surface Resistivity	ASTM D257	$>10^{15}$ Ω
Dissipation Factor	ASTM D150	<0.001

8. Chemical Resistance

LDPE exhibits excellent resistance to:

- Water
- Salt solutions
- Acids (dilute)
- Alkalis
- Alcohols
- Detergents
- Most inorganic chemicals

LDPE may be attacked by:

- Strong oxidizing agents
- Aromatic hydrocarbons
- Chlorinated solvents
- Certain organic solvents at elevated temperatures

9. Processing Conditions

Injection Molding

Parameter	Typical Range
Melt Temperature	160 – 240°C
Mold Temperature	20 – 50°C
Injection Pressure	50 – 120 MPa
Screw Speed	Moderate

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Film Extrusion

Parameter	Typical Range
Barrel Temperature	160 – 220°C
Die Temperature	180 – 230°C
Blow-Up Ratio	2:1 – 4:1

Blow Molding

Parameter	Typical Range
Melt Temperature	170 – 220°C
Mold Temperature	15 – 40°C

10. Storage and Handling

- Store in a cool, dry, ventilated location.
- Avoid direct sunlight.
- Protect from moisture and contamination.
- Keep packaging sealed until use.
- Recommended storage temperature: below 40°C.
- Avoid prolonged exposure to heat sources.

11. Packaging

Available in:

- 25 kg bags
- 500 kg jumbo bags
- 1000 kg jumbo bags
- Bulk shipment (upon request)

Packaging may vary depending on supplier and grade.

12. Regulatory Compliance

Depending on grade, LDPE may comply with:

- FDA 21 CFR requirements for food-contact applications
- EU Regulation (EC) No. 1935/2004
- REACH requirements
- RoHS requirements

Compliance must be confirmed for the specific production grade.

13. Recycling Information

Recycling Code: ♺ #4 LDPE

LDPE can be mechanically recycled and reprocessed into:

- Bags
- Film products
- Containers
- Composite plastic products

14. Disclaimer

The values presented in this Technical Data Sheet are typical properties of general-purpose LDPE and are not intended as product specifications. Actual properties may vary depending on manufacturer, grade, processing conditions, additives, and testing methodology. Users should evaluate suitability for their intended application through independent testing.