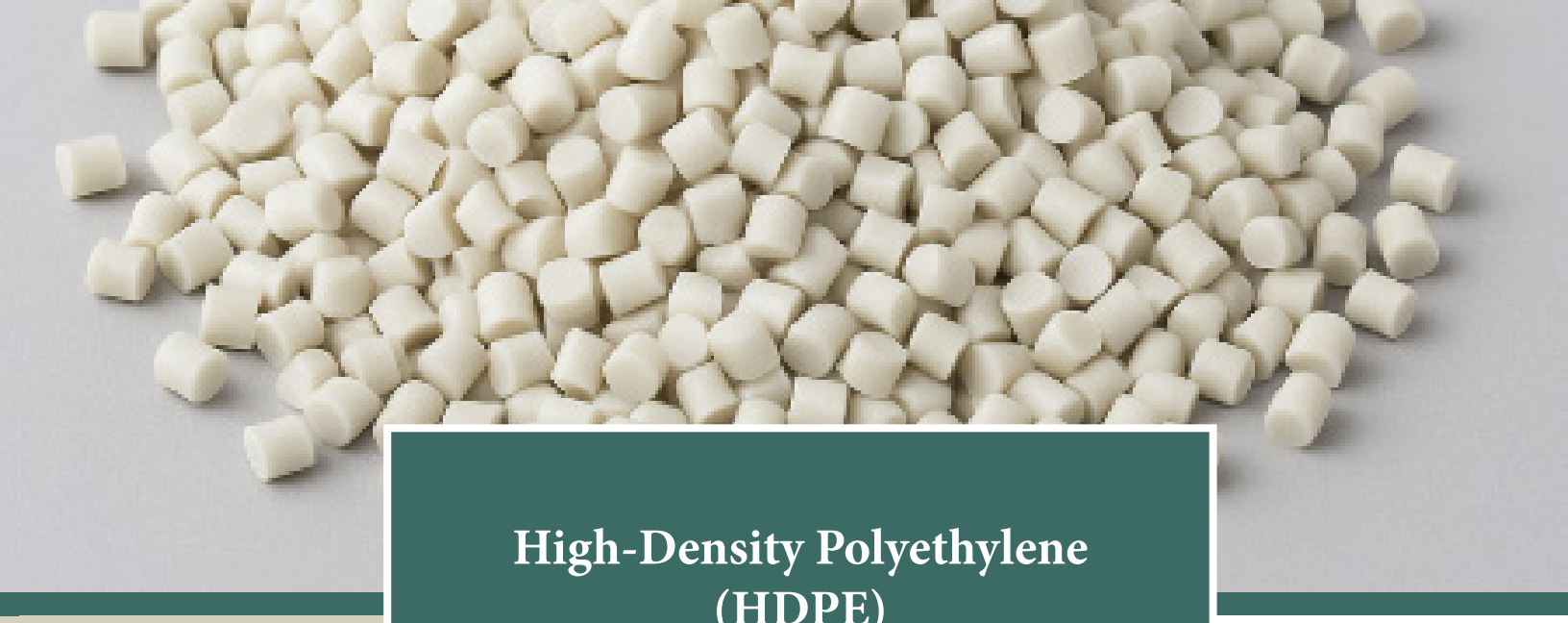

High-Density Polyethylene (HDPE)

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High-Density Polyethylene (HDPE) is a tough, lightweight thermoplastic recognized for its strength, rigidity, and exceptional chemical resistance. It offers low moisture absorption and excellent impact durability

What is HDPE?

HDPE is a polymer made from petroleum-derived ethylene monomers that are densely packed to create strong molecular bonds. This high-density structure gives the material its rigidity, tensile strength, and resistance to chemicals and environmental stress cracking. Unlike lower-density polyethylene, HDPE maintains its shape under load and performs reliably across a broad temperature range.

Common Applications

HDPE is used in industries where durability, moisture resistance, and chemical stability are critical. Typical applications include:

- Piping and conduit systems
- Industrial containers and liners
- Extruded profiles and protective covers
- Marine and outdoor components
- Sheets, panels, and construction products

Benefits

1. Excellent chemical and moisture resistance
2. High strength-to-density ratio
3. Superior impact resistance, even at low temperatures
4. Excellent processability for extrusion and molding
5. UV-stabilized grades available for outdoor use

Limitations

1. Can become brittle under prolonged UV exposure without additives
2. Lower temperature resistance compared to some engineering plastics
3. Difficult to bond or paint without surface treatment
4. Not inherently flame retardant