

Material Datasheet — Polyethylene (HDPE-type)



Lightweight polyolefin with good chemical resistance and electrical insulation; moderate stiffness and low friction.

This datasheet is suitable for designers of threaded components and hinge assemblies made from this material.

Key specifications

Item	Value
Continuous Use Temperature	$\approx 80\text{ }^{\circ}\text{C} / 176\text{ }^{\circ}\text{F}$
UL 94 Flame Rating	HB
Density	$0.94\text{--}0.96\text{ g/cm}^3$

Mechanical properties (typical)

Property	Test method	Typical value	Unit
Tensile strength (23 °C)	ISO 527	20–35	MPa
Tensile modulus (23 °C)	ISO 527	0.8–1.3	GPa

Thermal properties

Property	Test method	Typical value	Unit
Melting temperature	ISO 11357	130–135	°C
HDT (0.455 MPa)	ASTM D648	40–60	°C

Electrical properties

Property	Test method	Typical value	Unit
Dielectric strength	IEC 60243	25–35	kV/mm
Relative permittivity (1 MHz)	IEC 60250	2.3–2.4	—
Dissipation factor (1 MHz)	IEC 60250	≤ 0.0005	—

Tribology

Property	Test method	Typical value	Unit
Coefficient of friction	—	0.20–0.30	—

Moisture & environment

Property	Test method	Typical value	Unit
Water absorption (24 h)	ISO 62	≤ 0.01	%

Chemical compatibility — high-level guidance

Excellent resistance to aqueous chemicals; avoid strong oxidizing acids and aromatic solvents.

Assembly guidance — threaded parts & hinges

- Use a torque wrench and target application-validated torque; account for material creep/relaxation over time.
- Distribute bearing stresses with appropriate washers or flange features.
- For low-friction materials, consider prevailing-torque nuts, thread-locking, or mechanical locking features.
- Avoid sharp stress concentrators near thread run-outs and hinge knuckles; use generous fillets and radii.
- Observe service temperature, environment (chemicals/UV/steam), and moisture conditioning effects before final torque/preload selection.
- Match mating material where galvanic/corrosion or differential expansion could be a factor.