

Polyester Film

Electrical insulation and layer separation in cable construction

Descripción

Polyester film (PET) is a thermoplastic film that combines dimensional stability, mechanical strength and consistent dielectric properties across a wide thickness range. Its molecular structure makes it the reference material for electrical insulation in cable manufacturing, with a surface resistivity of $1.5 \times 10^{13} \Omega$ and volume resistivity of $2.0 \times 10^{14} \Omega \cdot m$ per ASTM D257.

In cable construction, polyester film acts as a separator between conductive layers, as primary insulation or as reinforcement of the main insulation. Its smooth surface eases high-speed helical taping and its tensile strength (170–190 N/mm² depending on thickness) ensures integrity through the manufacturing process, without breaks or deformation.

Thicknesses range from 12 to 350 μm , with dielectric strength from 3.4 kV at the finest thickness up to 16.9 kV at 125 μm . This range allows the insulation level to be matched to each construction's requirements, from instrumentation cables to power cables.

Propiedad	Method	12 μm	19 μm	23 μm	36 μm	50 μm	75 μm	125 μm
Grammage (g/m ²)	—	17	26.6	32.2	50.4	70.0	105.0	175.0
Tensile strength (N/mm ² , min.)	ASTM D882	170	190	190	190	190	180	170
Elongation at break (% , min.)	ASTM D882	90	90	90	90	90	120	120
Dielectric strength (kV)	JIS C2151	3.4	5.1	7.9	9.0	10.8	13.3	16.9
Thermal shrinkage (% , 150°C/30 min)	—	2.8	2.8	2.8	2.8	2.8	3.0	2.8

Electrical properties (common to all thicknesses)

Propiedad	Value	Test method
Surface resistivity	$1.5 \times 10^{13} \Omega$	ASTM D257
Volume resistivity	$2.0 \times 10^{14} \Omega \cdot m$	ASTM D257

Guía de selección

The right thickness depends on the balance between required insulation level, available space in the construction and mechanical demands during manufacturing. The most common thicknesses and their typical use by cable type are summarised below.

Thickness	Dielectric strength	Typical application	When to choose
12 µm	3.4 kV	Fine separation between conductors	Tight spaces, optimised cost
19 µm	5.1 kV	Standard insulation in instrumentation cables	Cost/performance balance
23 µm	7.9 kV	Separation in pair and data cables	General use, good handling
36 µm	9.0 kV	Reinforced insulation	Higher dielectric strength required
50 µm	10.8 kV	Low-voltage power cables	High mechanical strength
75 µm	13.3 kV	Primary insulation in special cables	High elongation (min. 120%)
125 µm	16.9 kV	Maximum insulation	Demanding processes, maximum protection

Additional thicknesses available on request: 15, 150, 190, 250 and 350 µm.

Variantes disponibles

Colours and finishes

- Natural (transparent) — standard
- Black (opaque)
- Milky white
- Increased opacity (hazy)
- Custom colours on request

Special treatments

- Application-specific surface treatments available on request.

Alternative materials

- Polyethylene film (PE)
- Compact polypropylene film (PP)

Formatos de entrega

The supply format directly influences process continuity and taping efficiency. Material can be supplied in different formats and dimensions adapted to each machine type and production speed.

Pad / Roll (pancake)

Core ID:	76 mm (3"), 102 mm (4.5"), 152 mm (6")
Max OD:	80 - 600 mm
Width range:	5 - 1000 mm
Core material:	Plastic or cardboard

Spool (TWS / STS reel)

Core ID:	76 mm (3")
Max OD:	300 - 320 mm
Width range:	3.5 - 80 mm
Winding type:	Traverse Wounded (TWS) or Step to Step (STS)
Core material:	Plastic or cardboard, pre-cut versions available

The mechanical and electrical values shown below come from tests run to international standards and characterise the material's behaviour both during processing and in service.

Los valores indicados son típicos y no constituyen especificaciones vinculantes.