

Expanded Polypropylene

Electrical insulation and separation with cushioning effect in communications and power cables

Descripción

Expanded polypropylene (PPF) is a mono-oriented film with a closed-cell structure that combines electrical insulation properties with a mechanical cushioning effect. Its reduced density of 0.52 g/cm³ — roughly half that of compact polypropylene — provides meaningful thickness with low added weight, while the cellular structure delivers thermal-conductance resistance of 0.08 W/m·K that contributes to cable thermal insulation.

In communications, power and signal cable construction, PPF is used as electrical insulation, separator between components and bundling element. Its expanded structure absorbs dimensional irregularities between layers and provides a degree of compressibility that eases cable shaping without damaging internal components — especially relevant in cables with optical fibres or delicate conductors.

Thicknesses range from 80 to 300 µm with dielectric strength from ≥1.3 kV in the finest references up to ≥2.0 kV in the thicker ones. The specific resistance of 10¹⁵ Ω·cm provides very high-quality electrical insulation, while the relative permittivity ≥1.2-1.3 minimises dielectric losses in high-frequency applications.

Mechanical properties

Propiedad	Método	PPF 80	PPF 90	PPF 125	PPF 170	PPF 300
Thickness (µm)	DIN 53370	80	90	125	170	300
Thickness tolerance (%)	DIN 53370	±12	±12	±10	±10	±10
Weight (g/m ²)	DIN 53352	43	48	65	89	160
Weight tolerance (%)	DIN 53352	±8	±8	±7	±7	±7
Density (g/cm ³)	DIN 53479	0.52	0.52	0.52	0.52	0.52
Tensile strength (N/mm ²)	DIN EN ISO 527-1	90	90	100	85	80
Elongation at break (%)	DIN EN ISO 527-1	15	15	15	15	15
Tensile strength at 5% elong. (N/mm ²)	DIN EN ISO 527-1	35	35	40	30	25
Shrinkage 100°C/10 min (%)	DIN 40634	3	3	3	3	3

Electrical properties

Propiedad	Método	PPF 80	PPF 90	PPF 125	PPF 170	PPF 300
Relative permittivity	DIN 53483	≥1.2	≥1.2	≥1.3	≥1.3	≥1.3
Dielectric strength (kV)	DIN 53481	≥1.3	≥1.3	≥1.5	≥2.0	≥2.0
Specific resistance (Ω·cm)	DIN 53482	10 ¹⁵	10 ¹⁵	10 ¹⁵	10 ¹⁵	10 ¹⁵

Thermal properties

Propiedad	Método	Value
Thermal conductance resistance	DIN 52612	0.08 W/mK
Thermal shrinkage (100°C/10 min)	DIN 40634	3%
Resistance to copper contact	—	No perceptible deterioration after 7 days at 100°C

Construcción

Base material	Polypropylene
Structure	Closed-cell, expanded
Orientation	Mono-oriented

Guía de selección

The right thickness depends on the balance between required insulation level, desired cushioning effect and available space in the construction. Thinner gauges offer greater flexibility, while thicker ones deliver greater mechanical protection and dielectric strength.

Reference	Thickness	Weight	Dielectric strength	Tensile strength	Typical application	When to choose
PPF 80	80 µm	43 g/m ²	≥1.3 kV	90 N/mm ²	Fine separation, signal cables	Maximum flexibility, tight spaces
PPF 90	90 µm	48 g/m ²	≥1.3 kV	90 N/mm ²	Standard insulation	Flexibility/insulation balance
PPF 125	125 µm	65 g/m ²	≥1.5 kV	100 N/mm ²	Telecom cables	Greater dielectric strength, general use
PPF 170	170 µm	89 g/m ²	≥2.0 kV	85 N/mm ²	Power cables, bundling	Moderate cushioning effect
PPF 300	300 µm	160 g/m ²	≥2.0 kV	80 N/mm ²	Maximum mechanical protection	Pronounced cushioning, fibre-optic protection

Variantes disponibles

Standard thicknesses

- 80, 90, 125, 170, 300 µm

Alternative materials by application

- Compact polyester film (PET) — when greater dielectric strength per thickness is required
- Non-woven polyester (NWP) — when easy stripping is required
- Compact polypropylene film (PP) — when no cushioning effect is required

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"), 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

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

Los valores indicados son típicos y no constituyen especificaciones vinculantes.