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High-Permeability PID-Resistant EVA Encapsulant Film for Photovoltaic Modules

This catalog describes a high-permeability EVA encapsulant film from CNCGLASS, offered for the glass side of a photovoltaic module and formulated to resist potential-induced degradation. Ethylene-vinyl acetate copolymer is combined with the additives needed for encapsulation. The film holds the cells, lets sunlight reach them, and shields them from outdoor conditions.

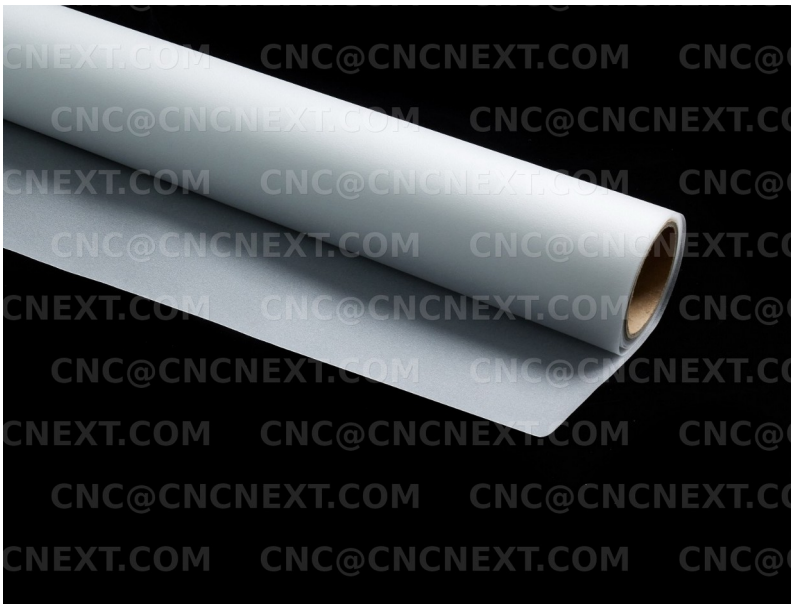


Figure 1. High-permeability EVA encapsulant film on the roll.

1. High Ultraviolet Passage on the Glass Side

When this film sits next to the glass, a large share of the ultraviolet band is allowed through. Transmittance from 290 nm to 380 nm is at least 80 %. In the 380–1,100 nm band, transmittance is at least 91 %. Compared with an ordinary EVA encapsulant film, that extra passage of light can raise module conversion efficiency by 1.5 % to 5 %.

2. Lasting Bond and Outdoor Endurance

The film is intended to keep a firm peel strength after aging, so that a module exposed outdoors does not delaminate over a 25-year life. It remains stable with the other materials in the package. It is resistant to heat, humidity, and ultraviolet light, and it is PID-resistant. Operators generally find it easy to laminate, which helps to keep the cycle short and the line efficient. The high transmittance is what allows the module to deliver as much power as the cell design will allow.

Property	Value
Thickness	0.3–1.0 mm
Width	Up to 1,400 mm
Roll length	150–350 m
Areal-density tolerance	± 4 %
Density	0.95–0.96 g/cm³
Degree of crosslinking	≥ 75 %

Tensile strength	≥ 18 MPa
Elongation	≥ 500 %
Water absorption (20 °C, 24 h)	≤ 0.1 %
Peel strength to glass	≥ 60 N/cm
Peel strength to the backsheet	≥ 40 N/cm
Shrinkage, machine direction (MD)	≤ 3.0 %
Shrinkage, transverse direction (TD)	≤ 1.5 %
Volume resistivity	≥ 1×10^{15} Ω·cm
Dielectric breakdown strength	≥ 26 kV/mm
UV aging, ΔYI (120 kWh/m², 1,000 h)	≤ 4
Damp-heat aging, ΔYI (85 °C / 85 % RH, 1,000 h)	≤ 4
Transmittance, 380–1,100 nm	≥ 91 %
Transmittance, 290–380 nm	≥ 80 %

Lamination Guidance

The figures below are a starting window for a single-chamber laminator and for a two-chamber laminator. The temperature and the cycle times may be trimmed to suit the machine that is actually in use, provided the degree of crosslinking stays inside the accepted band; about 85 % is a practical target. Every other material in the stack should be a grade that has already passed inspection by a recognized testing body for this industry.

Single-chamber cycle

Item	Typical setting
Laminating temperature	142 ± 2 °C
Vacuum time	360 ± 60 s
Hold pressure, three stages	−70 / −45 / −20
Hold time	600–660 s

Two-chamber cycle

Item	Typical setting
First chamber temperature	122 ± 2 °C
First chamber vacuum time	360 ± 60 s
First chamber hold pressure, three stages	−70 / −45 / −20
First chamber hold time	180 ± 30 s
Second chamber temperature	145 ± 2 °C
Second chamber vacuum time	30 ± 10 s
Second chamber hold pressure, three stages	−70 / −45 / −20
Second chamber hold time	480 ± 60 s

Storage and Handling

Keep the rolls in a cool, dry room held at a steady climate: not above 30 °C and not above 60 % relative humidity. The film may be stored for up to six months; it is better to put it into production within three months. The rolls are vacuum packed. The usual inner pack length is 150–300 m per roll, unless a different length is agreed. For long-term storage, stack the rolls no higher than five layers, so that the film is not bent or crushed under its own weight. Do not allow the film to pick up moisture. Once a pack has been opened, or once the film has been cut, it is best to use it within 48 hours. Static charge can disturb lamination, so the whole module line should be kept free of unwanted static.

Commercial Notes

Please contact CNC@CNCNEXT.COM for pricing, width and thickness options, and packing details for this high-permeability, PID-resistant EVA encapsulant film.

Contact Us

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We will be glad to advise on this high-permeability EVA encapsulant film for the glass side of photovoltaic modules.