Solar Encapsulation Materials (EVA / POE)

Film structure switching as bifacial and N-type modules take over

Base year	History	Forecast
2025	**2020–2025**	**2026–2030**
Regions	Segments	Formats
3	**3**	**PDF / Excel / PPT**

Abstract

This report focuses on the key polymers in PV module encapsulation — EVA and POE films, plus backsheets and silver paste. The central question is how demand structure shifts toward POE-based films as N-type cells (TOPCon, HJT) and bifacial modules gain share, and whether EVA capacity faces structural idling.

It covers demand, capacity and price transmission for both chemistries and assesses how PID resistance and water-vapour transmission requirements constrain formulation.

Key findings (excerpt)

- SMM sizes 2025 demand at 1.5811 million tonnes for PV-grade EVA and 0.9758 million tonnes for PV-grade POE; with tight POE supply, EVA could rise to 1.9124 million tonnes while POE falls to 0.6768 million tonnes, a combined output value above RMB 50 billion.
- Resin and film are two different scopes: global POE demand was about 1.12 million tonnes in 2024 with a ~5.72% ten-year CAGR (per Eastern Shenghong), and PV-use POE demand is expected to pass 500,000 tonnes in 2025.
- Film-level volumes are smaller: global POE encapsulant film demand was about 286,000 tonnes in 2025, up 66.3% from 172,000 tonnes in 2023 (28.9% CAGR); N-type TOPCon POE film penetration has passed 71% and HJT depends almost entirely on POE/EPE (IIM).
- Rising N-type and bifacial penetration is displacing single-layer EVA with POE and EPE co-extruded structures; PID resistance and moisture barrier performance are the core module requirements and directly determine formulation.
- POE pellets were heavily import-dependent, so domestic supply sets film makers' cost flexibility; EVA faces structural idling risk, with commodity grades potentially oversupplied while PV-grade high-MFI resin stays tight.

PV encapsulation demand: resin versus film scope

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Scope and material	2025 demand	Scenario note
PV-grade EVA (SMM)	158.11 万吨	Up to 1.9124 Mt if POE is tight
PV-grade POE (SMM)	97.58 万吨	Down to 0.6768 Mt if POE is tight
PV-use POE (Eastern Shenghong)	突破 50 万吨	Total POE demand ~1.12 Mt in 2024
POE encapsulant film (IIM)	28.6 万吨	0.172 Mt in 2023, 28.9% CAGR

SMM is PV-grade resin; Eastern Shenghong is the PV share of total POE demand; IIM is finished POE encapsulant film. The three are not directly comparable.

Source: SMM、东方盛虹（中国经营报）、IIM 信息，2025

4 in total, all listed in the full edition

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Method and definitions

This brief is built from public sources: Chinese and English industry and consultancy reports, annual reports and prospectuses, customs and statistical series, and public capacity or expansion announcements by main participants. Where two sources disagree on the same metric, both figures are shown with the reason for the gap instead of being averaged. Amounts are in USD at nominal value unless stated; capacity is in 10k t/yr. Forecast window 2026–2030, base year 2025.

Data updated：{'zh': '季度更新', 'en': 'Quarterly'}

Coverage

- China
- Southeast Asia
- Europe & North America

Excerpts below let you judge structure and methodology; the paid edition lists everything.

Main participants (excerpt)

- 福斯特 / First
- 海优新材
- 斯威克
- 赛伍技术
- 三井化学 / Mitsui
- LG Chem

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Sources (excerpt)

1. A 上海有色网 SMM《不同光伏组件封装方案下的 EVA、POE 光伏料市场规模展望》：2025 年 EVA 光伏料 158.11 万吨、POE 光伏料 97.58 万吨；POE 偏紧情形下 EVA 191.24 万吨、POE 67.68 万吨；两者综合产值超 500 亿元。https://hq.smm.cn/photovoltaic/content/102148906（2026-11 访问）
2. B 中国经营报（引东方盛虹与长江证券）：2024 年全球 POE 需求约 112 万吨、未来十年 CAGR 5.72%；2025 年全球光伏用 POE 需求预计突破 50 万吨；POE 下游中汽车占 51%、光伏 18%。http://dianzibao.cb.com.cn/html/2025-09/15/content_337886.htm（2026-11 访问）
3. C IIM 信息《2026-2030 年全球 POE 封装胶膜产业深度与洞察研究报告》：2025 年全球 POE 封装胶膜需求 28.6 万吨（2023 年 17.2 万吨，CAGR 28.9%）；N 型 TOPCon 对 POE 胶膜渗透率突破 71%。https://www.iim.net.cn/2358/view-330370-1.html（2026-11 访问）

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