



Exceed™ Stiff+ Exxtra™ Seal Exceed™

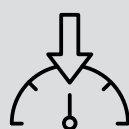
Next-gen oil film: Downgauged solution for high-speed VFFS up to 60 packs/min



High VFFS line speed at up to 60 packs/min



Outstanding seal integrity



Downgauging opportunity



Excellent bag drop performance

Data and results presented herein apply specifically to the noted application under this case study. Your results may differ depending on factors such as operating conditions, equipment and materials used.

Challenge

With the emergence of advanced vertical form fill seal (VFFS) technology enabling higher line speeds, the edible oil packaging industry faced a challenge: creating packaging solutions that could maximize this capability by improving productivity, operational efficiency, and reducing material usage.

Traditionally, one-liter edible oil pillow pouches in India use 90–95µm films and run at 35–40 packs per minute on VFFS machines. While this has been the norm, brand owners and converters sought a breakthrough that could significantly increase line speeds without compromising on film integrity or packaging performance, ensuring readiness for next-generation of high-speed operations.

Solution

Leveraging ExxonMobil Signature Polymers performance polyethylene (PE) technology, four industry leaders collaborated to develop oil film capable of achieving line speeds up to 60 packs per minute on VFFS machines, delivering a step-change performance. This solution was designed to meet current market needs while ensuring scalability for next-generation high-speed flexible packaging.

Key enablers of the breakthrough:

- ExxonMobil Signature Polymers team provided formulation expertise and high-performance pPE grades resins, enabling downgauging without compromising seal integrity or film performance.
- Vishakha Polyfab, a leading barrier film producer/converter, applied advanced film manufacturing technology to produce the optimized film.
- Nichrome India Ltd, an integrated packaging solutions company, enabled high-speed filling performance using the optimized film on their new-generation VFFS machines with Advance Sealing technology.
- Cargill, as the brand owner, conducted full-scale production trials to confirm real-world performance and consumer readiness.

The ExxonMobil Signature Polymers resin grades used include:

- Exxtra™ Seal: Low seal initiation temperature for efficient sealing, improved hot-tack strength, and a broad operating window
- Exxtra™ Stiff+: Enhanced processability with excellent stiffness toughness balance
- Exceed™: Exceptional mechanical performance for downgauged film

Results

The collaboration delivered an innovative, scalable, high-speed packaging solution for edible oil pillow pouches. Mechanical strength and seal integrity were fully retained as compared to the reference film, ensuring reliable performance under real-world conditions.

Rigorous testing showed:

- **Zero failures** during manual squeeze tests
- **100% pass rate** in bag drop tests (10 pouches dropped consecutively on 3 sides from 1.5m height)
- **No leakage** during transportation trials (200 pouches transported ~900 km by road)

These results confirmed the solution's robustness and reliability for high-speed VFFS operations and demanding supply chain environments.

Performance highlights of the optimized film include:

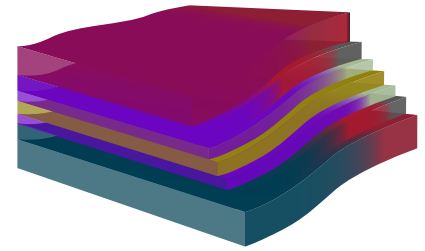
- **50% productivity boost:** Line speed increased from 35–40 packs/min to 55–60 packs/min.
- **Enhanced seal integrity:** Low rejection rate and strong bag drop performance

Through advanced material technology and strong value chain collaboration, we delivered an 85µm oil film that runs at up to 60 packs per minute without compromising performance, setting a new benchmark for speed and reliability in edible oil packaging.

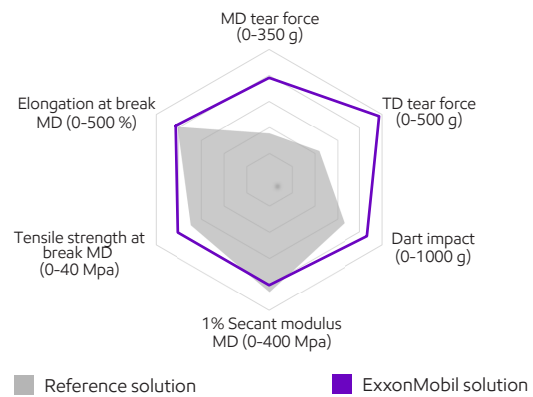
Edible oil pillow pouch film

Thickness: 85 µm

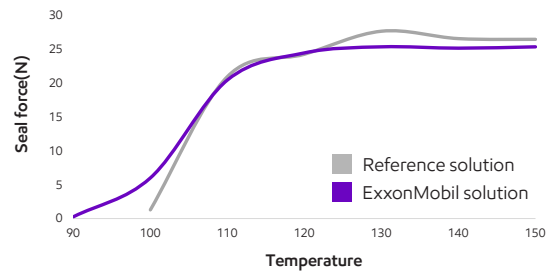
- Exceed™
- Exceed™ Stiff+
- LDPE
- Slip additive
- WMB
- Tie
- PA
- Exxtra™ Seal



Film performance data



Seal strength curve



Property tested	Test method based on
Dart drop impact resistance	ExxonMobil method
Tensile force at 1%	ExxonMobil method
Rupture strength	ExxonMobil method
Haze	ExxonMobil method
Needle puncture resistance	ExxonMobil method
Bag drop	ExxonMobil method

Data from tests performed by or on behalf of ExxonMobil. 2025-RTI-R2503-026656

ExxonMobil
Signature Polymers

Bring your impossible

ExxonMobil Signature Polymers was born from the belief that people fuel progress. From automotive and construction to packaging, agriculture, industrial, and beyond, we leverage the scale and reach of ExxonMobil to deliver the insights and innovations that empower our diverse, global partners to take their businesses to new heights. We continuously work to provide the listen-first, service-driven, game-changing collaboration that unlocks opportunities for our partners and advances their business goals.



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