Polyethylene rich (>95%[1]) pouches for edible oil with improved recyclability* and uncompromising package functionality

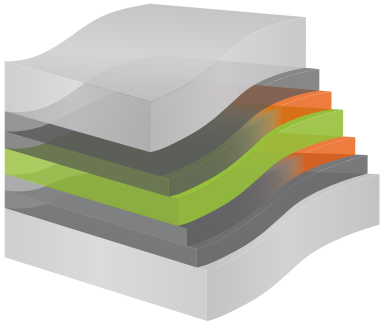
- Recyclable*
- High O_2 barrier
- Optimal processing
- Optimized Vertical Form Fill and Seal (VFFS) operation

Challenge:

The goal was to produce a recyclable*, edible oil package with very high PE content (>95%[1]) while maintaining physical property performance.

Reference oil film

7 layer structure design

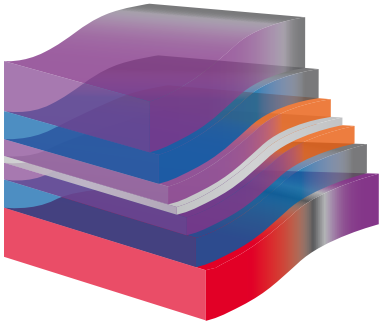


- mC6-LLDPE
- C4-LLDPE
- PA
- Tie resin

Thickness: 80 µm

ExxonMobil PE rich oil film solution

High barrier 7 layer film with extreme performance



- Exceed XP 8784
- Exceed S 9272
- Exceed 1012
- SoarnoL DC3203RC
- Tie resin

Thickness: 80 µm

[1] Calculated based on weight (target)
* Recyclable in communities with programs and facilities in place that collect and recycle plastic film.

LDPE: 0.924 g/ cm³, 0.75MI; C4-LLDPE: 0.918 g/ cm³, 1 MI
Tie resin (concentrated): MAH grafted LLDPE;

Solution:

Creation of > 95% PE[1] edible oil package, with high oxygen barrier & outstanding package integrity through exceptional stiffness and toughness balance. The film was produced with ExxonMobil performance PE resins like Exceed™ S, Exceed™ XP, Exceed™ and a special SoarnoL EVOH resin for high clarity and high gas barrier.

The films were made on a HEPTAFOIL®- 7 layer co-extruded blown film line from Rajoo Engineers Limited run at apx. 490 kg/h. ExxonMobil resins such as Exceed™ XP 8784 provide step-out toughness, Exceed™ S 9272 provides high dart-drop impact and stiffness balance, Exceed™ 1012 provides excellent heat sealing and hot tack performance. The SoarnoL DC3202RC is designed for high clarity with high gas barrier properties. The package was then formed and filled with edible oil on a commercial scale VFFS packaging line at VFSS OEM end, which resulted in good hermetic packs while achieving desired packaging line speeds.

Polymer production → ExxonMobil

MITSUBISHI CHEMICAL GROUP
Mitsubishi Chemical Singapore

Film production → RAJOO® excellence in extrusion

HEPTAFOIL®
Seven Layer co-extruded blown film line

VFFS packaging operation → Produced 1L pouch on a PE friendly VFFS line with continues heat sealer, while maintaining vertical and horizontal seal temperatures of ~180 °C

Results:

The solution contains no polyamide (PA) in the formulation which was developed using Exceed™ S 9272, Exceed™ XP 8784, Exceed™ 1012 performance PE and SoarnoL DC3203RC provides the following benefits compared to that of the reference film which contains PA.

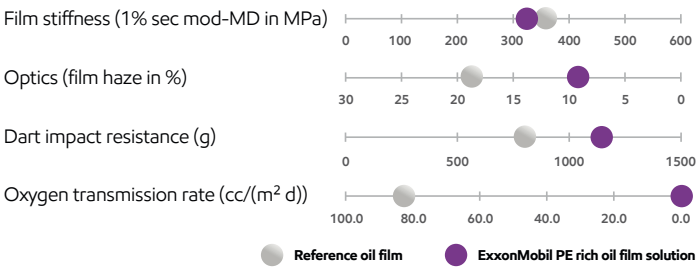
- Deliver outstanding package integrity
- Comparable film stiffness
- Up to 50% lower haze
- Up to 40% higher dart impact load
- Much higher oxygen barrier

Packaging trial observation:

- Smooth machineability
- Up to 55 packs/min line speed achieved

Pack integrity test observation:

- Zero failures during hand squeezing test (tested 10 samples)
- 100% pass (out of 10 pouches; each dropped from 1.5 m, 3 sides consecutive drops)
- No leakage (out of 200 pouches) during transportation trial (~700 km by road)



In summary, using the latest generations of performance PE from ExxonMobil and SoarnoL DC3203RC, it is possible to create >95%[1] PE-based pouches for edible oil packaging, while maintaining packaging integrity, optics, machinability and packaging line speed during VFFS operation.

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