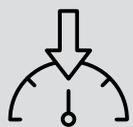




Exceed™ Stiff+ Exceed™ Flow+ ExxonMobil™ LD

Armando Alvarez introduces a big innovation in low, small greenhouse tunnels in partnership with ExxonMobil Signature Polymers



Downgauging opportunity



Strong mechanical properties



Durable

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

Create downgauged raspberry-specific greenhouse tunnels with extended mechanical performance

Low greenhouse tunnels are simple and light structures, used to protect crops from harsh weather and external threats. They regulate thermal conductivity during daytime and prevent heat loss at night. These films can be manufactured with 12, 10 or 5 mm-diameter perforations, with different patterns, to regulate ventilation inside the low tunnel, assisting in crop development. Long life and durability are essential as films can stay in the field for up to three years.

Armando Alvarez, a global agriculture market solution leader, in conjunction with its Spanish affiliate Reyenvas (who is producing and selling the low tunnels), wanted to create a tunnel specifically designed for raspberries to complement its currently available strawberry tunnels. Key to this design were the requirements of durability, extended performance and the opportunity to downgauge.

Solution

Exceed™ Stiff+, Exceed™ Flow+ and ExxonMobil™ LD 01820

While Exceed Stiff+ high performance polyethylene provided excellent stiffness and toughness balance, Exceed Flow+ high performance polyethylene contributed to improved processability and high impact resistance. ExxonMobil™ LD 01820, made it possible to use low-density polyethylene (LDPE), hence allowing the introduction of a higher amount of ExxonMobil Signature Polymers high performance polyethylene resins.

“We recognized that Armando Alvarez wanted to maintain its leadership position and was looking to extend its product line,” said Nadia Cannell, Head of Europe Market Development; Agriculture, ExxonMobil Signature Polymers. “They were attracted to the processing capabilities and enhanced performance provided by ExxonMobil Signature Polymers.”

“We continuously seek to improve our solutions to help farmers and the society,” said Jose Gutierrez Albuquerque, Head of R&D, Reyenvas SA. “Thanks to ExxonMobil Signature Polymers, we were able to develop a thinner but stronger tunnel film to serve our customers.”

Results

- The 20% downgauged raspberry tunnel film (100 µm) delivers excellent impact resistance performance compared to the reference film (125 µm).
- 20% increased Elmendorf tear resistance helps ensure durability over the film's 36-month lifetime.
- 15% higher dart drop impact resistance and comparable needle puncture resistance help the film withstand harsh weather conditions.
- The thinner gauge and improved mechanical properties allow cost optimization potential.

Force at 1% strain - Machine direction (MD) (N)



Force at 1% strain - Transverse direction (TD) (N)



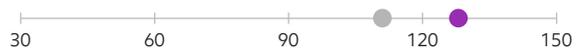
Elmendorf tear resistance - MD (g)



Needle puncture resistance- Maximum force (mN)



Instrumented dart (N)



● Market reference (125 µm)

● ExxonMobil Signature Polymers solution (100 µm)

Property	Test method based on
PE tensile	ExxonMobil method
Elmendorf tear resistance	ASTM D1922
Needle puncture resistance	ExxonMobil method
Instrumented dart	ISO 7765-2

Data from tests performed by or on behalf of ExxonMobil. Data traceability: 2025-RTI-4890

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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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