ExxonMobil
Signature Polymers

Case study



Exceed™ Tough+

Vatan Plastik introduces premium Vatan Power multi-season greenhouse films enhanced with ExxonMobil Signature Polymers resin solutions

Tensile strength | Tear resistance | Puncture resistance | Durability

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

Meeting the growing demand for durable greenhouse films that require less frequent replacement and provide reliable protection for high-value crops.

Greenhouse agriculture is expanding worldwide as growers adopt more controlled environments to safeguard crops, extend growing seasons, and increase yields. However, the operating conditions for greenhouse films can be severe. These films must endure prolonged exposure to UV radiation, heat and cold, wind load, and physical abrasion, all of which can compromise the durability and mechanical integrity of polyethylene films designed for multi-season use.

While many converters use C8LLDPE and LDPE blends to achieve toughness and strength, these materials have limitations, particularly when films must perform reliably for multiple seasons. Common failures include tearing during installation, punctures from contact with greenhouse structures, and gradual loss of tensile strength due to environmental fatigue. As growers seek longer lasting greenhouse solutions that can protect high-value crops across multiple growing cycles, converters need materials that deliver superior toughness, better mechanical retention, and enhanced durability compared to C8LLDPE and LDPE blends.

Solution

Replacing 20% of Vatan Plastik's existing C8LLDPE and LDPE formulation with Exceed™ Tough+ m 0512 performance PE resin.

To address these challenges, Vatan Plastik worked with the ExxonMobil Signature Polymers team to create a new greenhouse film solution. The outcome is Vatan Power, a premium film range engineered specifically for long-season applications where durability, strength, and weather resistance are essential.

This innovation was made possible by incorporating Exceed Tough+ m 0512 performance PE resin, which provides exceptional strength and toughness. By replacing all of the C8LLDPE (10%) and part of the LDPE (again 10%) in its existing formulation with 20% Exceed Tough+ m 0512, Vatan Plastik exceeded the mechanical performance values of its traditional solution and achieved a step-change improvement in film durability.

The upgraded formulation increases the film's resistance to mechanical impacts, installation stress, and environmental fatigue, helping greenhouse structures better withstand the demands of multi-season use.

vatan® PLASTİK SAN. TİC. A.Ş.

Results

With Exceed™ Tough+ m 0512 resin in the formulation, Vatan Power greenhouse film achieved a measurable and significant uplift in film performance. Testing confirmed substantial gains in durability and mechanical strength, validating the new product's suitability for demanding multi-season applications.

Mechanical performance improvements compared to C8LLDPE and LDPE solution include:

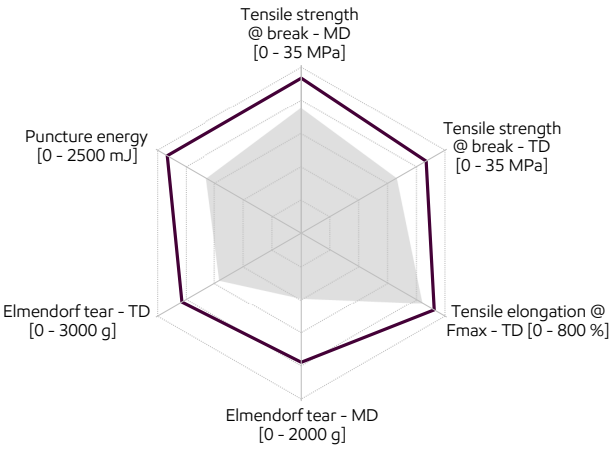
- **30% average increase in tensile strength** in both the machine direction (MD) and the transverse direction (TD)
- **2x increase in tear resistance** in MD
- **40% increase in tear resistance** in TD
- More than **40% increase in puncture energy**

These performance enhancements translate directly into stronger durability during greenhouse installation, greater resistance to wind related stress, and fewer mechanical failures during service life, all of which support higher potential crop yield.

The collaboration between Vatan Plastik and the ExxonMobil Signature Polymers application development team demonstrates how Exceed Tough+ m 0512 performance polymers can unlock new levels of mechanical strength and durability in greenhouse films.

By enabling the development of the Vatan Power brand, this partnership sets a new benchmark in multi-season agricultural film performance, helping farmers around the world protect their crops reliably and efficiently.

Mechanical performance comparison



Reference LDPE solution
180 µm

20% Exceed Tough+ m 0512 solution
180 µm

Test item	Test method
Tensile properties in MD/TD	ExxonMobil method
Elmendorf tear in MD/TD	ASTM D1922
Dart drop impact resistance (instrumented)	ISO 7765-2

Data from tests conducted by or on behalf of ExxonMobil. Data traceability R2510-030438

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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