



Exceed™ Stiff+

Enhancing silo bag performance with Exceed™ Stiff+ performance polyethylene



Stiffness/
toughness
balance



Superior impact
resistance



Excellent tear
strength



Great
dart drop

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

Traditional silo bags face several performance limitations, such as insufficient mechanical strength under heavy loads or harsh environmental conditions; vulnerability to punctures, tears, and creep, which can compromise the airtight seal and lead to spoilage; limited stiffness and dimensional stability affecting structural integrity during storage; Inconsistent impact resistance, especially during handling and transportation; need for enhanced performance without increasing material thickness, to maintain cost-effectiveness. These challenges demanded a next-generation solution that could elevate the durability, reliability, and overall performance of silo bags without compromising efficiency or affordability.

Solution

Extraplast, a Brazilian company specializing in agricultural solutions, partnered with ExxonMobil to develop a 7-layer silo bag incorporating Exceed™ Stiff+ performance polyethylene. This collaboration aimed to address the mechanical limitations of traditional silo bags and set a new benchmark in grain storage technology.

Technical advancements, such as a new formulation using Exceed™ Stiff+ m 0820 performance PE, delivered a superior balance of stiffness and toughness, resulting in enhanced tear resistance (Elmendorf), improved puncture and impact strength, greater creep resistance, optimized mechanical performance even at reduced thickness.

“The use of Exceed resin in the blend developed for the Extraplast silo bags goes beyond improvements in mechanical properties. It’s the certainty of working to improve the concept of food security,” notes Rodrigo Gerling, owner of Extraplast.

Results

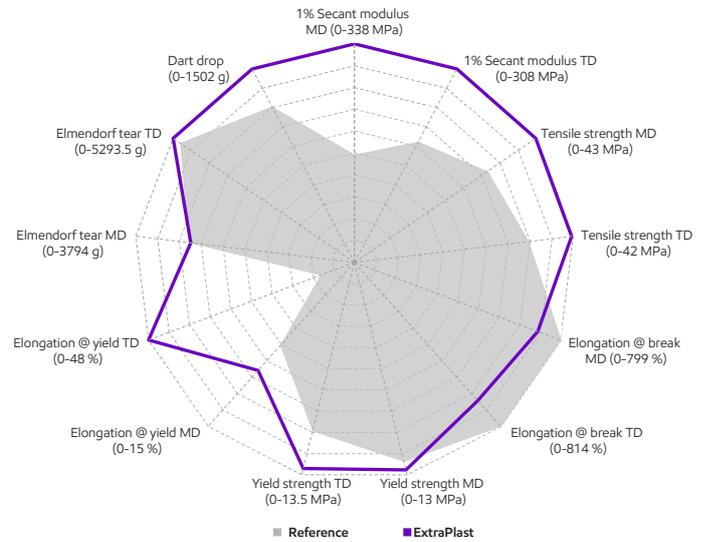
The incorporation of Exceed™ Stiff+ m 0820 into the silo bag formulation developed by Extraplast represents a significant advance in terms of technical performance and reliability for agricultural applications. Even with an average thickness slightly lower than the reference (225.3 µm against 238.6 µm), the Extraplast silo bag far exceeds the standards in practically all critical parameters.

The combination of high stiffness, superior mechanical strength, excellent impact and puncture performance, and remarkable creep stability highlights a highly optimized formulation. The creep values obtained at high temperature and at room temperature in TD were 9.3% and 3.3% respectively.

These attributes are essential to ensure the structural integrity of silo bags during prolonged storage of grains and forages, especially in harsh field conditions.

The partnership between Extraplast and ExxonMobil, with the use of Exceed Stiff+ PE, resulted in a high value-added solution for the agricultural sector, consolidating the 7-layer silo bag as a reference in the grain storage market. This is a clear example of how innovation in materials can transform the performance of essential products for the agribusiness production chain.

Comparison of reference with ExtraPlast silo bag



Test item	Test method
Thickness	ExxonMobil method
1% Secant modulus	ExxonMobil method
Mechanical tensile	ExxonMobil method
Elmendorf tear	ExxonMobil method
Needle puncture	ExxonMobil method
Dart drop	ExxonMobil method
Creep resistance	ExxonMobil method

R2506-028374 and R2504-027128 to Extraplast and R2206-007608 to reference

ExxonMobil
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Bring your impossible

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