



Exceed™ XP
when eXtreme Performance matters

ExxonMobil

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Bag-in-box solutions that reduce failure rates while using only half the plastic content



Recyclable



Toughness &
flex-crack
resistance



Package
integrity



Less
material use

This recyclable bag-in-box (BiB) solution helps to reduce waste, minimize product returns and uses less material thanks to the extreme toughness and flex-crack resistance provided by Exceed™ XP.

Challenge:

Develop a cost-effective bag-in-box packaging solution to minimize failures when transporting products long distances and under extreme conditions

Embaquim Industria E Comercio Ltda, a leading Brazilian liquid packaging producer, wanted to fabricate high-integrity 1,000 liter bag-in-box (BiB) packaging to transport liquids such as oils, chemicals and food concentrates. Package integrity is the key requirement because the bags are often transported over 2,000 kilometers (1,250 miles) from where they are filled to where the product is used. Existing bag-in-box solutions are typically made with two or three thick polyethylene films to help maintain packaging integrity while being transported over these distances, as failure can lead to waste and product returns.

Solution:

Design a sustainable and robust solution for bag-in-box packaging using Exceed XP performance PE polymers

Embaquim and **ExxonMobil** worked together to develop a new solution for 1,000 liter bag-in-box bag-in-box packaging, based on **Exceed XP performance PE polymers**.

Laboratory and transportation tests demonstrate that the new solution delivers higher toughness and flex-crack resistance than existing films, while allowing a material reduction of up to 50% per bag. The new BiB solution, which includes **Exceed XP 8656**, experienced zero bag failures during transportation, helping to reduce waste and minimize product returns.



Results:

Zero bag failures during transportation, reducing waste and product returns while using less material

Having worked with ExxonMobil and CETEA (Centro de Tecnologia de Embalagem), and with successful test results, Embaquim had no hesitation in bringing this new BiB solution to market. The key benefits of the solution include:



Recyclable bags where programs and facilities to collect and recycle them exist.



Extreme toughness and flex-crack resistance over a large surface area and large sealing seams.

50%

Up to 50% material reduction per bag.



Zero failures during transportation.



25% sales increase in long distance bags (> 2000km), which represents 33% of the segment.

Exceed™ XP performance PE polymers allow the fabrication of BiB packaging films with extreme toughness and flex-crack resistance. Even with less material per bag and a thinner gauge, the solution delivers extreme performance dart-drop, flex-crack and puncture resistance that is not achieved with a market reference solution.



"These new BiB films are tougher and more flex-crack resistant than existing solutions for less bag failure," said Renata Canteiro, R&D Director. "Films can even be downgauged from 100 micron to 70 micron, while the number of polyethylene layers can be reduced from three to two, resulting in substantial cost reduction per bag."

Exceed XP-based films deliver high-integrity BiB packaging solutions from the moment the bags are being filled to the minute the products are being used, enhancing end-customer satisfaction. As a result, Embaquim reports a 25% sales increase for bags used to transport liquids over long distances.

"These new bags could have a real impact on the industry," said Renata Canteiro. "Due to the potential to reduce material use by up to 50%, we estimate that a medium size BiB customer could save over 5½ tons of plastic per year when using the Exceed XP-based solution."

Figure 1: Mechanical properties

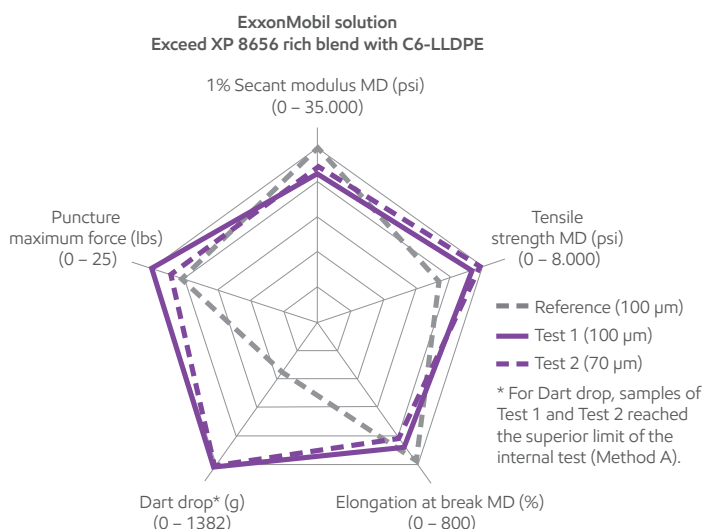
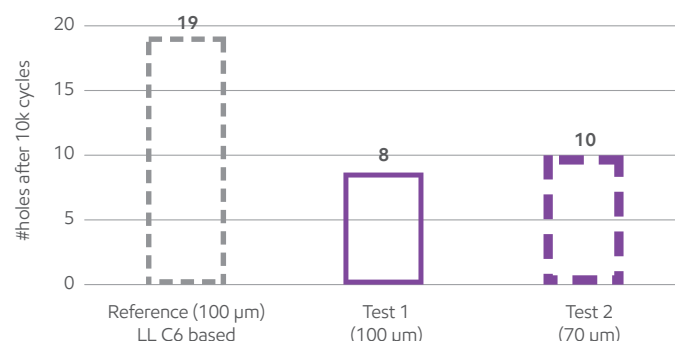


Figure 2: Flex-crack resistance



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