

Exceed™ Tough+

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

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™ Tough+



Recyclable



Toughness &  
flex-crack  
resistance



Package  
integrity



Less  
material use

### 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 Tough+ performance PE polymers.**


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

Laboratory and transportation tests demonstrate that the new solution delivers higher toughness and flexcrack resistance than existing films, while allowing a material reduction of up to 50% per bag. The new BiB solution, which includes Exceed™ Tough+ m 0516, 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:




**Bags designed for recyclability\***




**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™ Tough+ 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 Tough+-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 Tough+-based solution.”

Figure 1: Mechanical properties

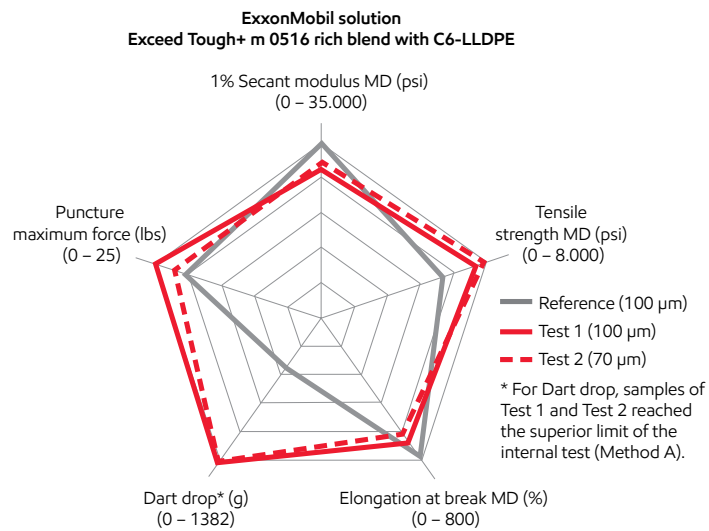
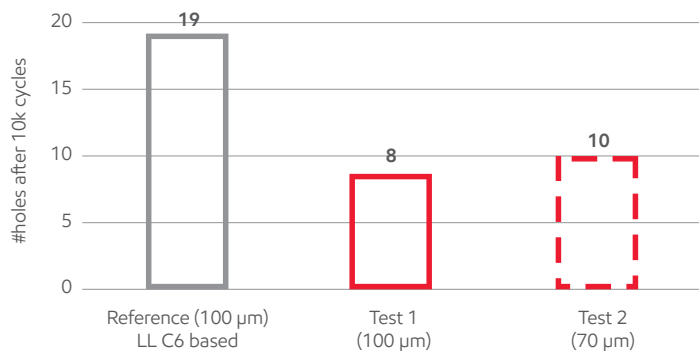


Figure 2: Flex-crack resistance



Contact us for more information: [exxonmobilchemical.com/pe](https://exxonmobilchemical.com/pe)

**ExxonMobil**  
*Signature Polymers*

**Bring your impossible**



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# What's new: ExxonMobil Signature Polymers

All our polymers are now positioned under a single portfolio brand: Signature Polymers. The aim is to simplify our product architecture and naming to improve portfolio navigation for you. We would like to stress that our commitment to high quality products remains the same, it is the names that change. Everything else remains the same. We will be making these modifications over the next six months so you will see both old and new grade names highlighted during that time.

Here's a quick overview of brands and grade names that have changed in this document:

Legacy commercial name	New commercial name
Exceed™ XP 8656	Exceed™ Tough+ m 0516

Some of our existing Exceed, Achieve, Paxon and premium PP/HD grades have moved to Exceed brand; most existing Enable grades have moved to Exceed Flow[+]; most of our existing Exceed XP grades have moved to Exceed Tough[+]; most of our existing Exceed S grades have moved to Exceed Stiff[+]. More details here [https://www.exxonmobilchemical.com/en/brands/signature-polymers/exceed\\_high\\_performance\\_polymers](https://www.exxonmobilchemical.com/en/brands/signature-polymers/exceed_high_performance_polymers) or contact your ExxonMobil representative to know more.

Want to see what's changed in our portfolio? Go to [exxonmobilchemical.com/sptransform](https://www.exxonmobilchemical.com/sptransform)