



Exceed™ Stiff+

Blowplast incorporates more than double the amount of post-consumer recycled (PCR) content in lubricant bottles while maintaining performance with the use of Exceed™ Stiff+ m 0238 performance polyethylene



Increased PCR content incorporation



Increased impact resistance



Improved stress crack resistance



Improved gloss

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

Incorporation of increased percentage of post-consumer recycled (PCR) content in blow molded lubricant bottles without sacrificing performance

A global sustainability initiative driven by East African brand owners established a requirement of at least 25% PCR content incorporation in lubricant bottles. Incorporating higher levels of PCR content with the incumbent HDPE used for blow molding the bottles, increased the brittleness of the bottles to the point where the bottles started to fail.

Local converter Blowplast, located in Nairobi, turned to ExxonMobil for help and advice after receiving the brand owner's request and finding that their current solution, based on ExxonMobil™ HD 5404, could not meet their new guidelines.

Solution

Partial replacement of ExxonMobil HD 5404 with Exceed™ Stiff+ m 0238 performance polyethylene

"When the brand owners modified their requirements, we were eager to retain their business," said Sanjay Brahmhatt- Group Managing Director, Blowplast. "ExxonMobil spent time understanding our needs and supported us during trials and development of a new solution."

Incorporating higher levels of PCR content initially made the bottle too brittle. Exceed Stiff+ m 0238 performance PE was added in small doses to help maintain performance while adding increasing amounts of PCR. Replacing ExxonMobil HD 5404 with Exceed Stiff+ m 0238 increased the strength of the bottle to such an extent that the amount of PCR content incorporated could be increased up to 50% with the addition of Exceed Stiff+ m 0238.

The 3-layer blow molding application features PCR content added into the core layer while the skin layers are pure Exceed™ Stiff+ m 0238 performance PE. The addition of Exceed Stiff+ m 0238 allowed a lower temperature setting at the extruder by 20 degrees C, which can translate into lower energy usage for the same number of bottles.

Results

Sanjay Brahmabhatt, Group Managing Director, noted, "Exceed Stiff+ m 0238 allowed us to not only increase the incorporation of PCR content, but the new solution outperforms our previous bottle. The brand owner did not have any issues with the higher flexibility and sees it as a feature. The more flexible bottle does not impact the supply chain as the bottles are shipped in cardboard boxes after filling.

Even though the bottle incorporates up to 50% PCR content, it still outperformed the incumbent HDPE-based solution incorporating 10% PCR content. This resulted in a lower failure rate (validated by the testing in the table below) thanks in part to improved impact strength and ESCR performance derived by adding Exceed Stiff+ m 0238 performance polyethylene."



Parameter	Standard	Without Exceed Stiff+ m 0238	With Exceed Stiff+ m 0238
Drop test	2 meters height dropping with no impact of breaking	Frequent failure up to 20% loss	Dropped and no breakage observed
Stack/load test	120kg load with no body deformation observed within 24 hours	120kg load with body deformation observed within 24 hours	120kg load with no body deformation observed within 24 hours
BCT	20kg load placed on j/can simultaneously with no deformation	20kg load placed on j/can simultaneously with deformation	20kg load placed on j/can simultaneously with no deformation
Leakage test	No leakage	No leakage	No leakage
Physical appearance	Original color good and matching	Original color good and matching	Original color good and matching
PCR consumption	To pass all the tests	Less consumption	It doubled the consumption

Data from tests performed by or on behalf of ExxonMobil

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

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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
Enable™ 4002	Exceed™ Stiff+ m 0238
ExxonMobil™ HDPE HYA 600	ExxonMobil™ HD 5404

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 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)