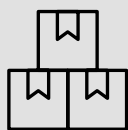




Exceed™ Flow

Ky Phat Corporation developed a pre-stretch hand wrap with enhanced containment force using ExxonMobil Signature Polymers Exceed™ Flow m 1716 to boost palletization productivity



Excellent load stability



Improved productivity



Reduced material use

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

Developing a pre-stretch hand wrap solution with high holding force and load stability to replace conventional, thicker hand wrap – while maintaining performance at equal wrap counts.

Stretch film is widely used for pallet wrapping and load bundling to help protect products from dust, moisture, pilferage, and shifting during transportation and storage, while not obscuring product visibility. High performance stretch wrap film plays an important role in reducing the risk of damage during transit.

ExxonMobil Signature Polymers collaborated with Ky Phat Corporation, a leading packaging manufacturer in Vietnam with over a decade of experience in stretch film production. Through close collaboration, both parties identified a key challenge faced by the industry: conventional pre-stretch hand wrap often requires many wraps to secure the load to the pallet and achieve the desired load stability which can be measured by containment force, ultimately reducing productivity.

Solution

Adding Exceed™ Flow m 1716 performance polyethylene resin into the film formulation can help enhance performance of pre-stretch hand wrap film.

Pre-stretch hand wrap is typically extruded using higher melt index (MI) resin to achieve the desired pre-stretch performance from a jumbo roll. In this case, Exceed™ Flow m 1716 performance polyethylene was used in a discrete layer (i.e. without blending), enabling smooth flow to the die edges. Despite its lower MI, Exceed™ Flow m 1716 processes similarly to Exceed™ m 3518, offering better* film processability while improving* the film's high tenacity performance. Head pressure and motor load were marginally higher as compared to Exceed™ m 3518 extruded under identical conditions.

*Compared to conventional mLLDPE film

Adding Exceed™ Flow m 1716 into the jumbo roll formulation resulted in a positive slope in the tensile curve, replacing the typical plateau, indicating enhanced film performance and delivering these potential downstream values:**

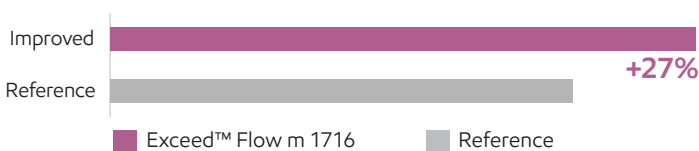
- Higher holding force than traditional Power Pre-Stretch (PPS) film solution.
- Improved load stability post pre-stretch operation.
- Excellent puncture resistance at final pre-stretched thickness, withstanding sharp corners.
- Eliminates the need for corner protectors due to better corner force.
- Reduces operator fatigue during daily wrapping operations.

Results

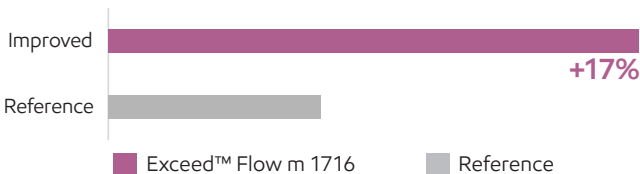
Improved performance observed during simulation period using enhanced film that contains Exceed™ Flow m 1716

On a Film Performance Tester (FPT), the ultimate tensile curve showed that both stretch force and wind force were notably higher compared to the reference jumbo film, while puncture force improved by 17%. After 48 hours of aging, the rolls were pre-stretched to a thickness of 7 microns. Film tested using the Film Edge Force (FEF) device revealed consistently higher force across all modules, with holding force improving by 27% — indicating a strong potential for increased containment force post pre-stretched. Corner force also improved by at least 35% across different film layers.

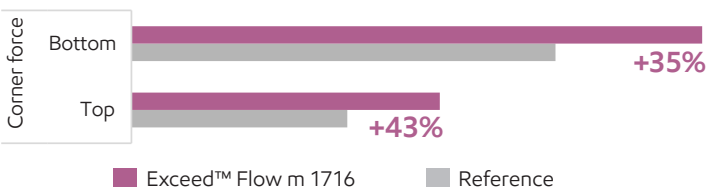
Holding force



Puncture force



Corner force



Photos of the simulated wrapped loads post- acceleration test



Wrapped using conventional pre-stretch hand wrap (7 µm thick)



Wrapped using pre-stretched hand wrap film containing Exceed™ Flow m 1716 performance polyethylene (7 µm thick)

To validate real-world performance, both films were used to wrap an estimated 1-metric ton load consisting of 1.5-litre sized bottled water (packed in dozens without a tray) stacked on a wooden pallet, using equal number of wraps. The wrapped loads were subjected to a truck simulation test, accelerating from 0 to 72 km/h in 5 seconds. The load wrapped with conventional pre-stretch hand wrap film experienced significant load shifting, with the bottles colliding against the simulator wall. In contrast, the load wrapped with the pre-stretched hand wrap film containing Exceed™ Flow m 1716 performance polyethylene demonstrated excellent rebound behavior. Post-test observations confirmed that the latter load retained its configuration and uniformity, outperforming the reference film in load stability.

Mr. Yeo Weijian, General Manager - South Asia Pacific Polyethylene Market Development at ExxonMobil notes, "Revolutionizing heavy load palletization has always been a challenge when transitioning from conventional thick hand wrap to thin pre-stretch alternatives. Our breakthrough creates dual economic advantages by maximizing yield from each jumbo roll while end users apply less film per pallet. Exceed™ Flow m 1716 can address the traditional trade-off between performance and cost and help enable operational efficiency across the value chain without disruption to existing workflows."

Mr. Sec Nhin Ho, Vice President at Ky Phat Corporation said, "At Ky Phat Corporation, we strive to fill the gaps in the marketplace through continuous innovation.

In collaboration with ExxonMobil Signature Polymers, we've developed a high-performance Pre-stretch Hand Wrap film using the latest Exceed™ Flow m 1716. This innovative solution significantly boosts operator productivity and enhances pallet stability, delivering greater efficiency and load security in every wrap."

By introducing Exceed™ Flow m 1716 into the film formulation, it is now possible to palletize heavy loads using 60% less film per pallet, without compromising wrapping productivity. This enables pre-stretch hand wrap to effectively replace conventional thicker hand wrap solutions.**

**Based on 7 µm improved pre-stretch hand wrap at 285 g/pallet compared to 17 µm conventional hand wrap with commodity (C4-LLDPE) at 735 g/pallet

What's new: ExxonMobil Signature Polymers

All our polymers are now positioned under a single portfolio brand: ExxonMobil 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™ 1617	Exceed™ Flow m 1716
Exceed™ 3518	Exceed™ m 3518

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)

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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