

FLEXIBLE POLYMERS

LUCOFIN® STRETCH HOOD SOLUTIONS –

STRONGER, FASTER, MORE SUSTAINABLE



... we make better polymers

LUCOFIN®: EFFICIENT PRODUCTION WITH ENHANCED PERFORMANCE

Stretch hood films manufactured with Lucofin® allow for faster processing speeds, significantly increasing production output. At the same time, they deliver superior holding force, ensuring stable and secure load containment during storage and transport. Combined with the potential for material savings through downgauging, Lucofin® enables a substantial reduction in overall packaging costs – without compromising on performance or protection.

INTRODUCTION: STRETCH HOOD

Stretch hood packaging comes with specific technical requirements, as the film must be stretched over entire palletized loads to provide maximum stability, protection, and efficiency. Compared to conventional stretch film, stretch hood solutions use significantly less material, contributing to cost savings and environmental benefits.

Thanks to its high elasticity, the film conforms seamlessly to various load shapes and sizes, making it ideal for a wide range of packaging applications. In addition, stretch hood offers superior protection against moisture, dust, and UV exposure – ensuring that products remain safe and intact throughout storage and transportation.

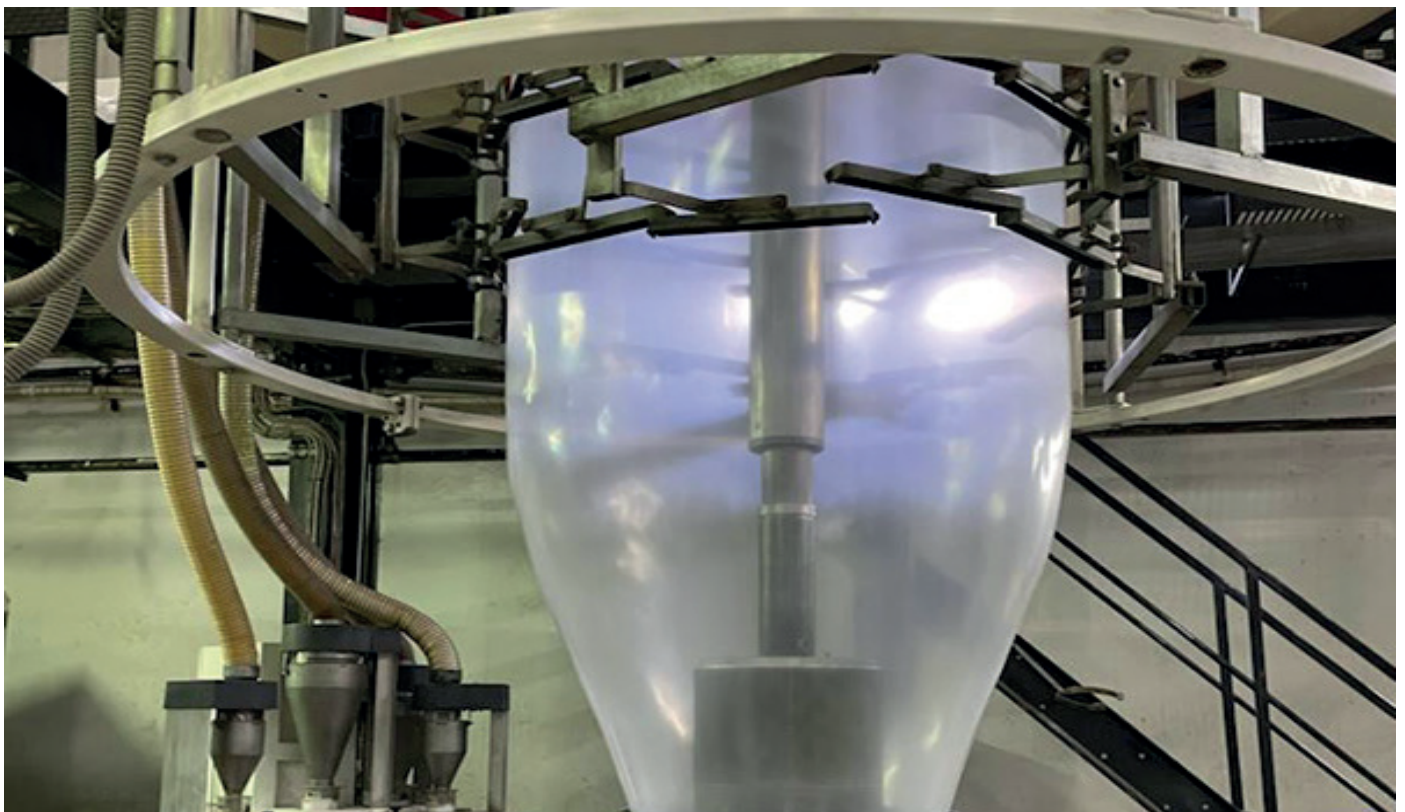
LUCOFIN® BASED STRETCH HOODS

Lucofin® is an advanced Ethylene Butyl Acrylate (EBA) copolymer that serves as a high-performance base material for stretch hood applications. Thanks to its excellent compatibility with a broad range of polymers – including PE, PP, PA, PBT, and TPU – as well as its ability to bond with metals such as aluminum and steel, Lucofin® offers outstanding formulation flexibility.

In addition to being fully recyclable, Lucofin® enhances the mechanical properties of recycled materials such as post-consumer

resins (PCR), making it an ideal solution for sustainable packaging. It also delivers remarkable elongation and tensile strength, particularly when combined with other polymers.

One of Lucofin®'s key advantages is its ability to support downgauging: even at reduced wall thicknesses, it ensures reliable processability and consistent film performance. This makes it a compelling choice for manufacturers seeking both cost efficiency and material savings without compromising on quality.



THE PROVEN 3-LAYER CONCEPT FOR HIGH-EFFICIENCY STRETCH HOOD FILMS

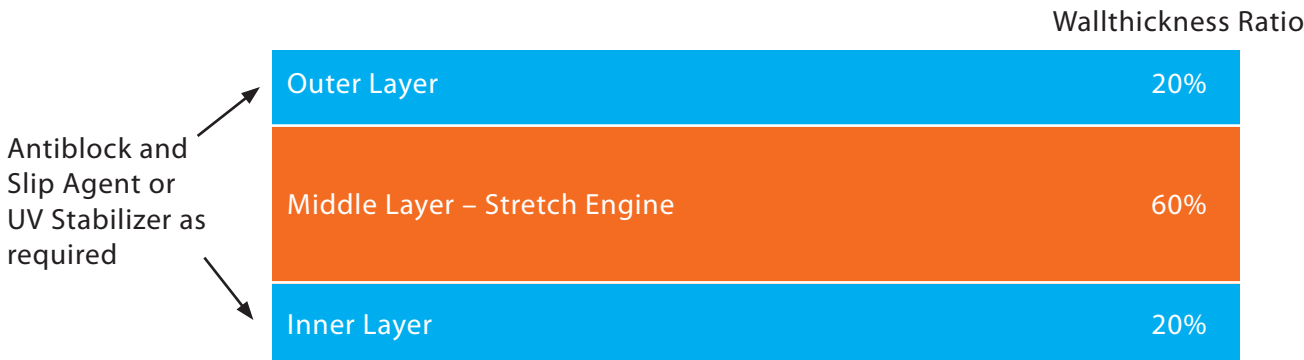
Modern stretch hood films are typically constructed using a proven three-layer blown film structure, which combines efficiency, performance, and adaptability.

This multilayer design consists of an outer layer, a middle “stretch engine” layer, and an inner layer, with a typical wall thickness ratio of 20% – 60% – 20%.

The outer and inner layers can be customized with functional additives such as antiblock agents, slip agents, or UV stabilizers, depending on application requirements. The middle layer, which accounts for the largest share of the structure, plays a central role in providing elasticity and retention force—making it the true engine of the stretch hood film.

To achieve optimal performance, the film formulation typically incorporates metallocene LLDPE with densities ranging from 0.905 to 0.918 g/cm³. In addition, a combination of soft or elastic materials is used to fine-tune film properties. These include Ethylene Vinyl Acetate (EVA), olefin-based plastomers or elastomers, and especially high-performance Lucofin®, an Ethylene Butyl Acrylate Copolymer (EBA) that enhances stretchability, bubble stability, and recyclability.

Thanks to this layered approach, manufacturers can achieve high holding force, downgauging potential, and excellent processing behavior – while meeting the most demanding packaging and protection requirements.



Cost-Efficient 3-Layer Structure with Lucofin®

The diagram illustrates the optimized three-layer structure of blown stretch hood films incorporating Lucofin® as a key material component. The structure follows a typical wall thickness ratio of 20% for the outer layer, 60% for the central stretch engine layer, and 20% for the inner layer.

Unlike conventional formulations that rely on 60% of high-cost polymers like EVA, POE, or POP in the middle layer, the Lucofin® solution replaces a significant portion of these materials.

With only **26% Lucofin®** used in the total film, the formulation delivers comparable or superior performance while reducing material usage and cost.

This composition enables **material cost savings of up to 15%**, making it one of the most economical alternatives on the market. Lucofin® thus combines performance, flexibility, and cost-efficiency – making it an ideal solution for modern stretch hood applications.

LUCOFIN® – ENGINEERED TO MEET THE HIGHEST DEMANDS IN STRETCH HOOD PRODUCTION



Lucofin® is designed to meet and exceed the most critical performance requirements in modern stretch hood film production. Through its optimized processing behavior and outstanding mechanical properties, Lucofin® enables manufacturers to operate at higher efficiency levels while maintaining consistent film quality.

Thanks to its excellent processability in blown film extrusion, Lucofin® allows for high output rates and remarkable bubble stability. This makes it particularly suitable for industrial-scale operations with minimal downtime.

With Lucofin®, converters and packaging manufacturers can achieve significant material savings and improved productivity – all while delivering reliable film quality for the most demanding stretch hood applications.

Key benefits:

- Highly efficient blown film extrusion with stable output and minimal variation
- Fast and flexible changeovers, reducing production delays
- Consistently uniform wall thickness, with distribution values below 3 Sigma
- Exceptional film elongation exceeding 500%, ensuring maximum adaptability
- High holding force, guaranteeing secure pallet stabilization
- Cost efficiency through optimized raw material usage
- Downgauging potential, enabling thinner films without sacrificing performance

LUCOFIN® – THE GAME CHANGER IN EXTRUSION EFFICIENCY

The graphic demonstrates how Lucofin® significantly improves the extrusion process for stretch hood film production. One of the most critical limiting factors in blown film extrusion is melt pressure, which directly affects production speed and process stability.

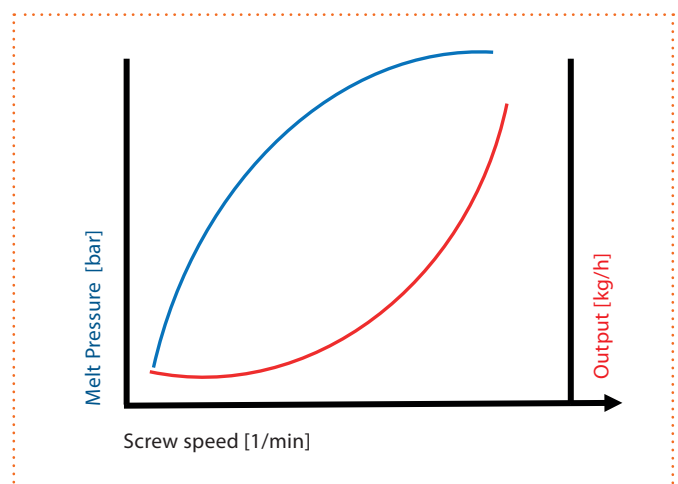
With Lucofin®, melt pressure is reduced by 10–20%, enabling smoother processing and allowing manufacturers to increase output by 10–15% (kg/h). In practical terms, melt pressure can drop from 400 bar to 300 bar, while maintaining excellent bubble stability and fast changeovers.

Additional process benefits include:

- Improved throughput due to lower melt resistance
- High process reliability with stable wall thickness distribution (1–3%)
- Efficient transitions during production runs
- Reduced mechanical stress on extrusion equipment

The chart on the left visually contrasts extrusion behavior with and without Lucofin®, illustrating how reduced melt pressure leads to a flatter curve and greater output potential at the same screw speed.

Conclusion: Lucofin® is not just a material – it's a processing accelerator that optimizes extrusion economics and performance in one step.



CONSISTENT PERFORMANCE EVEN AT REDUCED THICKNESS – DOWNGAUGING WITH LUCOFIN®

The bar chart illustrates the elongation and tensile strength of Lucofin®-based stretch hood films at different wall thicknesses (40 micron vs. 35 micron), measured in both machine direction (MD) and transverse direction (TD).

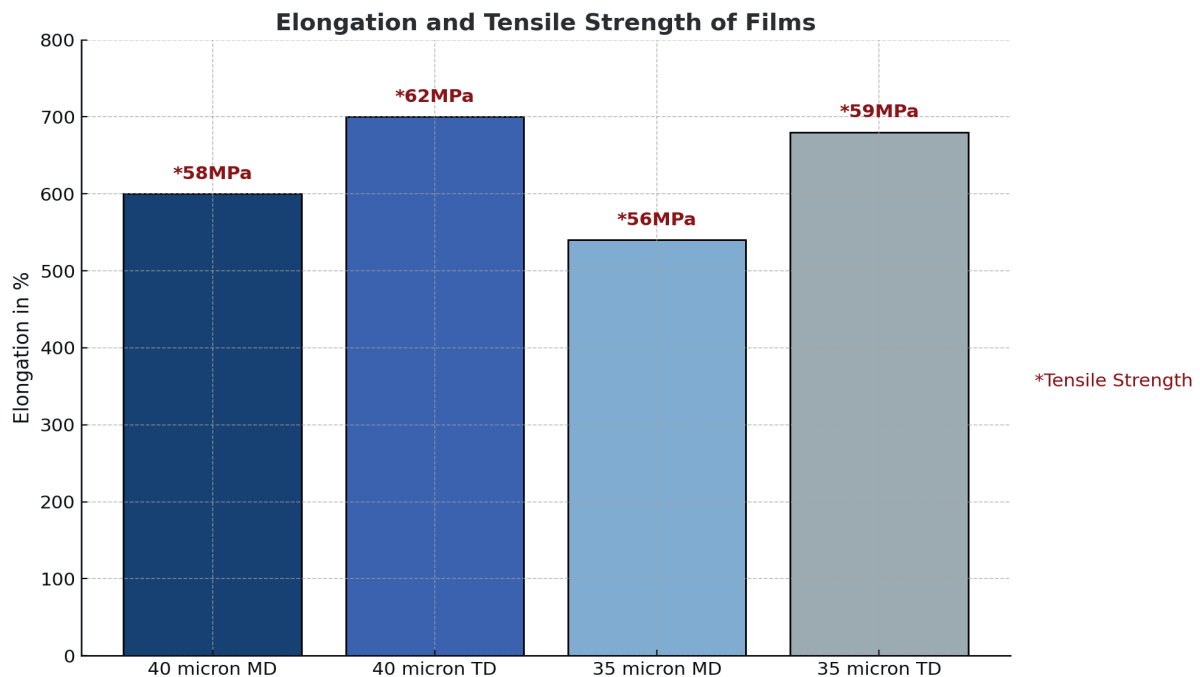
Despite a **13% reduction in wall thickness** (from 40 to 35 microns), the films maintain **excellent elongation values** – ranging from over 500% to nearly 700% – while achieving high tensile strength values between **56 and 62 MPa**.

This demonstrates that even with downgauging, Lucofin®-based formulations retain key mechanical properties essential for load

stability and packaging integrity. In fact, the film tested at 35 microns in TD achieved 59 MPa tensile strength – on par with the thicker variants.

Key Insight:

“Despite a slight increase in orientation, the film performed well with 13% less wall thickness” – underscoring Lucofin®’s ability to combine material efficiency with performance reliability.



Testimonial:

From a Major US Customer, reporting his test results of Lucofin® based Stretch Hoods on a shaker table to replicate transit conditions.

“Lucofin® performed very well, lasting the entirety of the typical testing time without any major shifting. On a further positive note, we actually had a couple of our competitor films on the table at the same time, with the same loads, and they failed almost immediately.”

OUTSTANDING MECHANICAL PERFORMANCE WITH LUCOFIN® STRETCH HOOD FILMS

The data table compares the key performance indicators of Lucofin®-based stretch hood films with two conventional competitor products. Across all tested parameters, Lucofin® 1400HN and 1083DN demonstrate clearly superior mechanical properties.

With significantly higher tensile strength in both machine and transverse directions, along with exceptional elongation values of over 840%, Lucofin® formulations provide outstanding holding force and flexibility. At the same time, they exhibit lower internal and external friction coefficients, which ensures smooth processing and improved load stability.

Particularly noteworthy are the high tear strength values– up to 89.5 N/mm – which more than double the performance of standard competitor films.

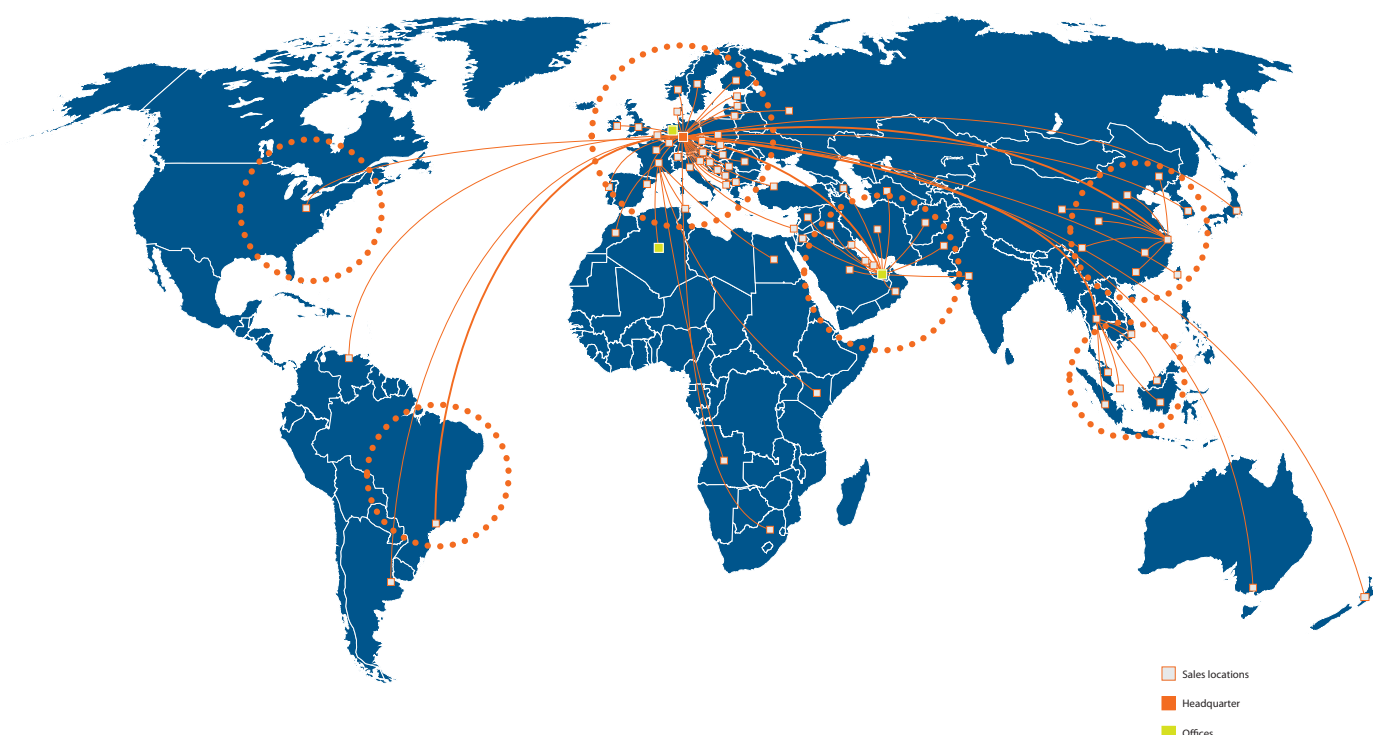
Thanks to these superior results, Lucofin® enables reliable downgauging, allowing for thinner films without compromising strength or durability– ultimately leading to material savings and improved efficiency.



TECHNICAL DATA

PARAMETER	UNIT	LUCOFIN 1400HN	LUCOFIN 1083DN	COMPETITION 1	COMPETITION 2
Average thickness	µm	102	102	103	103
Tensile strength MD	MPa	40,6	42,5	32,8	33,8
Tensile strength TD	MPa	40,9	43,5	34,6	35,6
Elongation at break TD	%	793,1	782,3	752,8	742,8
Elongation at break MD	%	840,7	848,3	791,9	770,1
Coefficient of internal friction		0,33	0,31	0,44	0,41
External friction coefficient		0,24	0,28	0,51	0,55
ODT MD tear strength	N/mm	70,8	75,1	36,6	32,5
ODT tear strength TD	N/mm	87,2	89,5	39,6	33,5

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