INMOLD

10+ YEARS OF REVOLUTIONIZING THE POLYMER FILM INDUSTRY

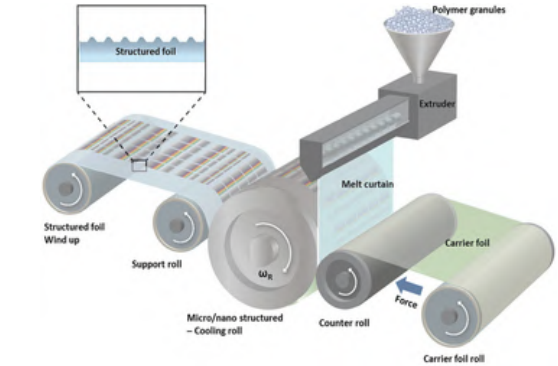
Enabling High Volume Production for Micro- and Nano- Structures

We offer a unique large-scale replication technique utilizing thermoplastic polymers, capable of producing customized thermoplastic films with thicknesses from 10 µm up to 300 µm suitable for **Lab-on-a-Foil**, **Optical** and **Product Development Projects.**

The microfluidics project has received funding from the European Union's HORIZON 2020 research & innovation programme under grant agreement no. 862092.

HIGH-THROUGHPUT REPLICATION PLATFORM

Our patented replication platform is based on Roll-to-Roll Extrusion Coating (R2R-EC), a technology with significant advantages.



A curtain of molten thermoplastic polymer is extruded onto a structured cooling roller. Upon contact with the hot polymer, structures become instantly imprinted into the polymer melt. The structured film is released (and winded) after solidification.

High flexibility Replicable feature dimension from low nanometer to hundreds of micrometer (incl. hierarchical structures)
High production speed Production volumes of up to several million square meters of structured film per year
Traditional thermoplastic Foil can be combined but also can replace parts made with injection molding
Easy integrable Established surface treatments and bonding methods applicable
Endless film Continuous process allows large footprints (above1.5m x1.5m) of customer devices

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THE PROCESS CHAIN

Design
We offer services and consultancy for implementation of decorative and functional features into products as well as help with adjusting the customer design for R2R production/ upscaling.

Structure creation (mastering)
We have access to state-of-the-art cleanroom facilities for producing functional surface structures and specific customer designs in silicon and other suitable materials, if necessary.

R2R replication in thermoplastic film
The customer design is replicated using our high throughput roll-to-roll process, creating an "endless" web of structured film. The produced film can be further processed or directly shipped to the customer.

Inline quality control
An advanced inline quality control (QC) system, consisting of a high-resolution microscope and a 70kHz confocal microscope system, ensures high replication quality.

TECHNICAL INFORMATION

Our In-House Extruder Machine

The roll-to-roll platform is equipped with advanced processing capabilities to support high-quality film development and material validation:

- Dual 25 mm single-screw extruders (L/D 30) featuring advanced Maddock mixing screws for excellent melt homogenization and consistent material processing.
- High-temperature processing capability up to 350 °C, enabling the development of a wide range of advanced polymer and functional materials.
- High-efficiency cooling roll stack supporting film production widths up to 450 mm (before trimming) for scalable film processing.
- Flexible process parameter control enabling a broad film thickness range from tens to several hundred microns.
- Integrated gravimetric dosing system providing precise material feeding and layer thickness control with ±0.5% accuracy.

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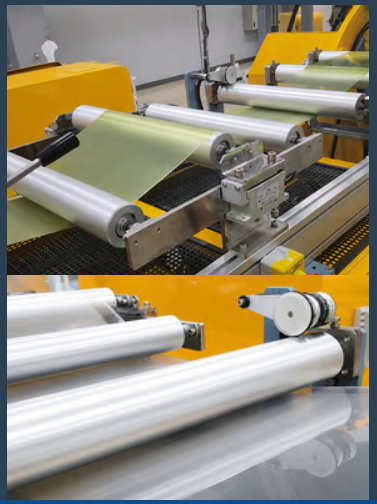

Curious if your design is suitable for R2R replication and upscaling?

Consider our replication test packages which cover preparation, execution, and analysis of a test replication with a custom design. This assesses design compatibility with our platform, scalability, and provides initial samples for customer evaluation. Visit **www.inmold.dk** to learn more about our services.

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