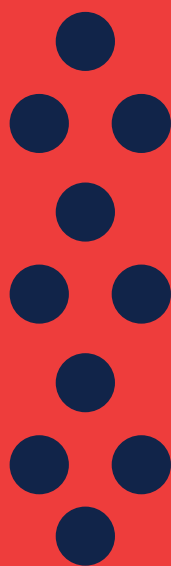




Experience, expertise and a clear focus on process enhancement have resulted in the development of our innovative Venturi drying systems for film casting applications.

ipco.com

— VENTURI — DRYING — SYSTEM — FOR — — CONTINUOUS — — FILM — CASTING



— INNOVATIVE DRYING SYSTEM FOR HIGH QUALITY FILM CASTING

Ongoing investment in R&D, coupled with our proven experience and expertise in process technologies for the production of film materials, has resulted in the successful development of an innovative Venturi drying system for film casting applications.

The production line begins with a slot die that applies an accurately controlled layer of liquid product onto a polished steel belt. From here it passes through the Venturi dryer where the solvent – aqueous or organic – is evaporated quickly, efficiently and in a manner that leaves the end product almost completely free of tension both laterally and longitudinally.

This high precision system dramatically improves the casting process, enabling the production of film products to exceptionally narrow tolerances without any risk of skin formation, and eliminating costly faults and imperfections in the final material. The inherent benefits of this indirect drying solution also result in a high degree of energy efficiency.


While the IPCO film casting system offers a number of unique market benefits, the compact

Venturi dryer can also be used in conjunction with other drying technologies including traditional impingement dryers.

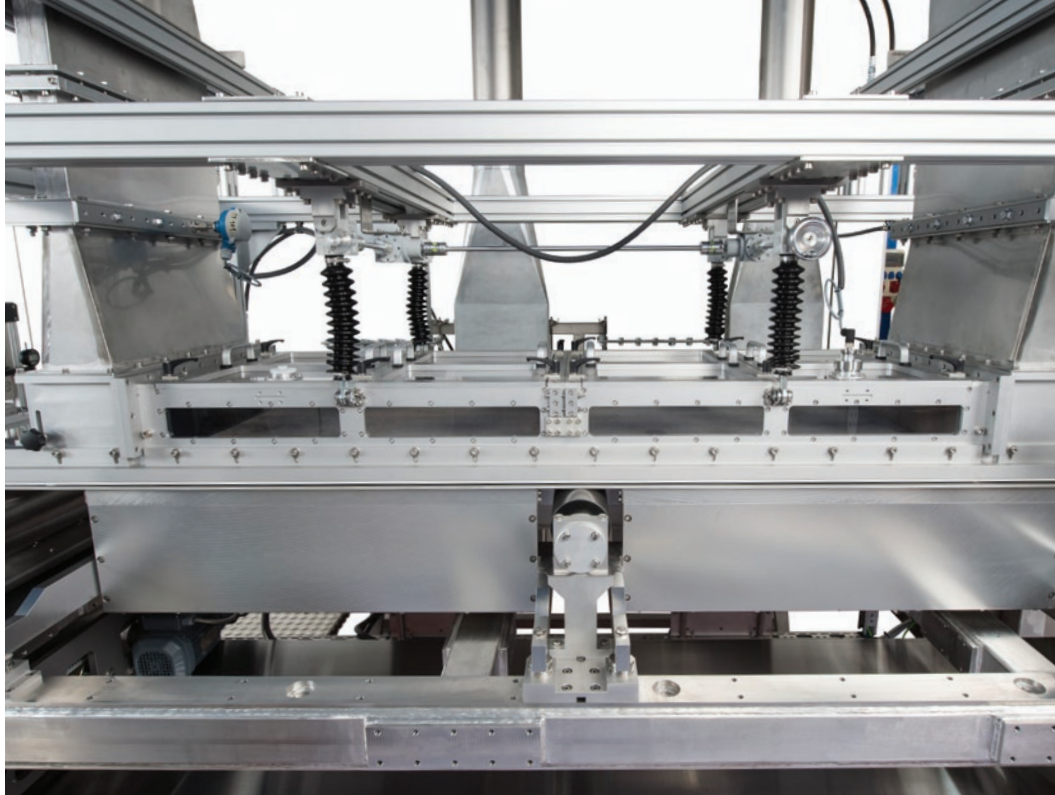
Excellent thermal and air flow effects

The key benefits of the IPCO Venturi dryer are achieved through the use of a permeable metal foam above the drying film. A flow of tempered air is applied to the upper side of this foam-like metallic material, creating a low negative pressure effect on the lower side in accordance with the standard laws of pneumatics.

As a result, a constant and even suction flow is formed, delivering a homogeneous drying effect. This minimizes thermally-induced shrinkage and eliminates the risk of structural defects in the surface and layer structure of the film.



Airflow over permeable metallic board creates low negative pressure effect for homogeneous drying.



Improved product quality, reduced drying times

The introduction of the IPCO Venturi dryer enables manufacturers to achieve significant improvements in product quality and reproducibility while also enhancing production efficiency. The increase in thermal transfer efficiency compared with conventional dryer systems also enables a reduction in the length of the drying section.

Typical film casting applications include:

Filter membrane (nitrocellulose)

- Applications: filters for pharmaceutical and food applications.
- Film thickness: 40–100 μm .

Ceramic tape (polymer resins)

- Applications: semiconductors, fuel cells, solar cells.
- Film thickness: 200–300 μm .



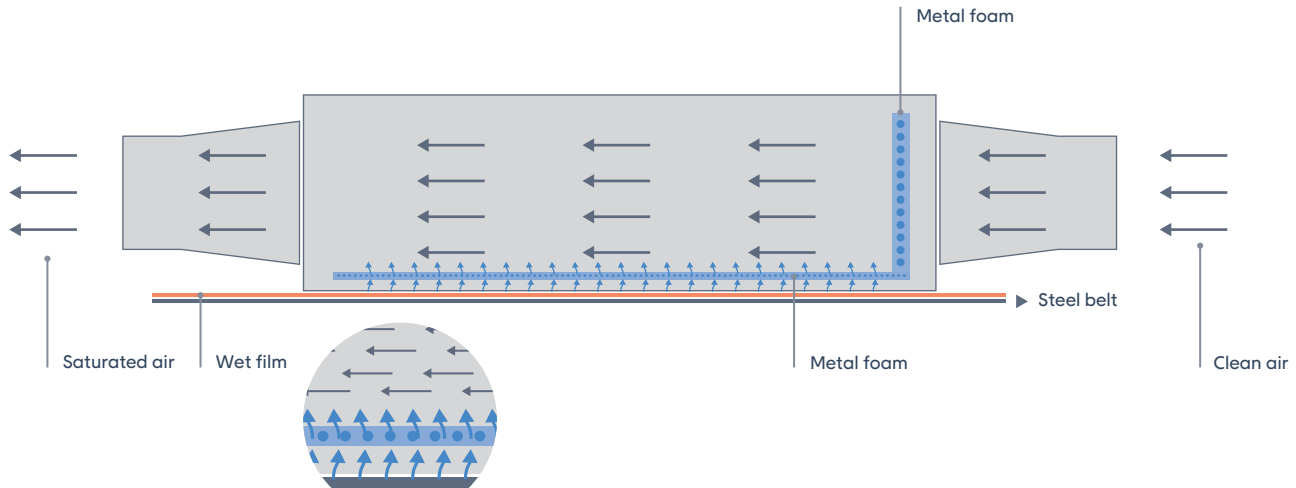
IPCO Venturi dryer

Steel belt-based film casting

Our film casting system delivers a homogeneous layer of liquid product onto a polished steel belt with outstanding consistency of thickness. The cast layer is then transported on the polished steel belt through the Venturi drying unit to achieve a stable, high quality product in an extremely efficient manner.

As well as the direct casting system shown below, the unit is also suitable for use on fixed casting tables:

- Efficient continuous production.
- Film thickness / flatness to fine tolerances.
- Low stress in the formed film.
- Elimination of faults and imperfections.



Edible films (soluble polymers)

- Applications: pharmaceutical capsules, pills.
- Film thickness: 40–50 μm .

Optical films (tac)

- Applications: LCD top film.
- Film thickness: 30–200 μm .

Battery film (li-ion)

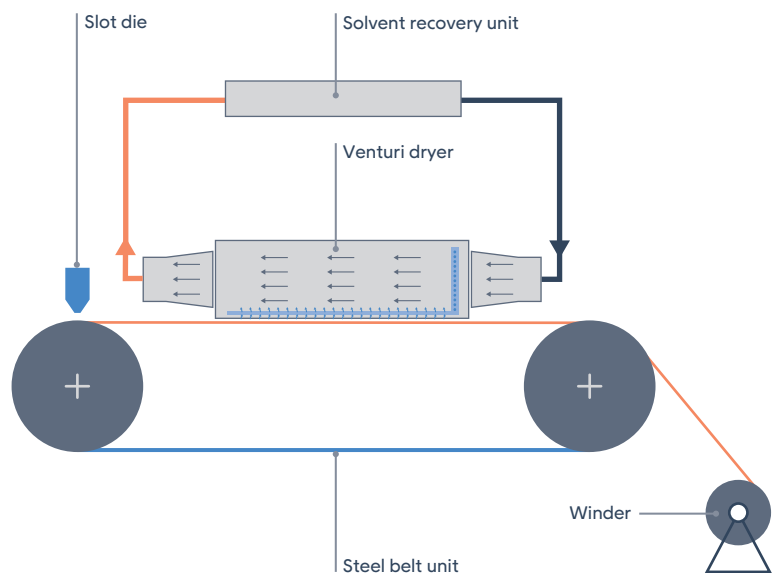
- Applications: Battery electrodes.
- Film thickness: 10–50 μm .

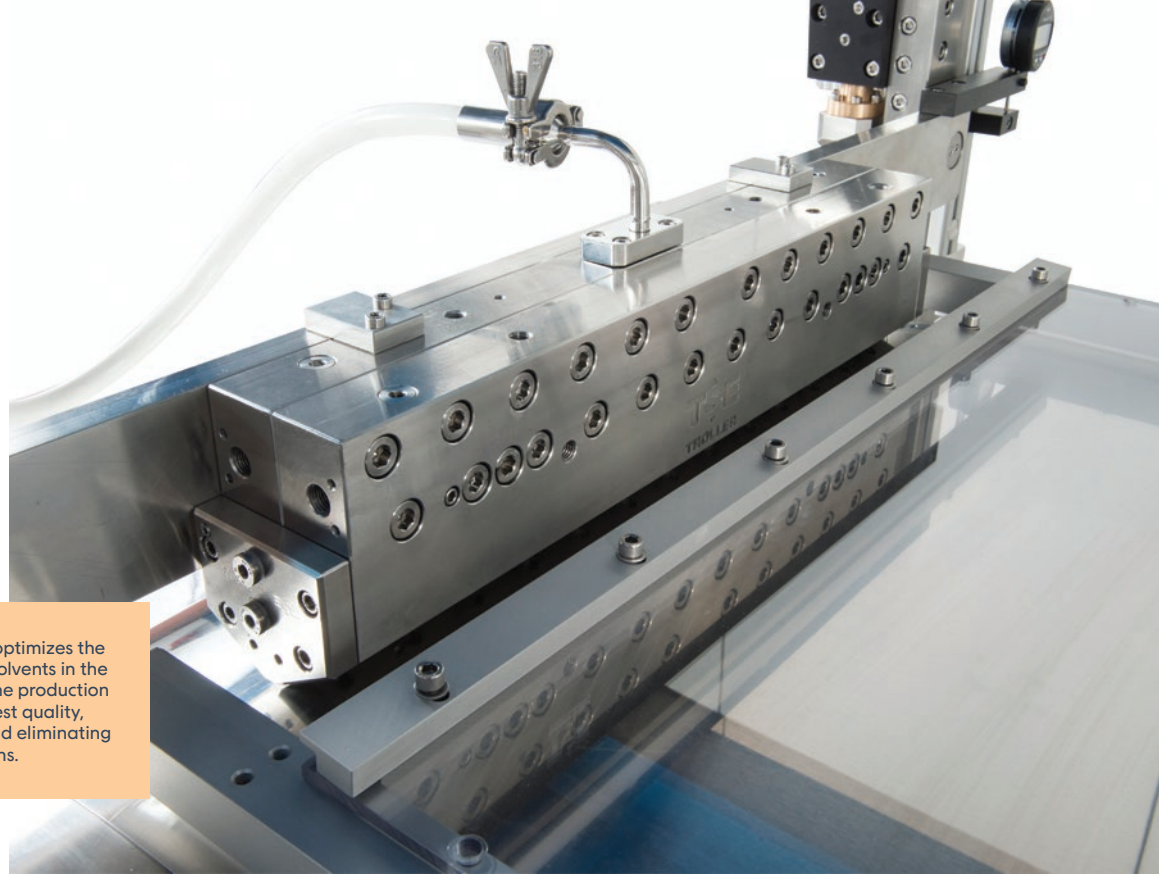
A solution based on market leading technologies

The IPCO Venturi dryer has been developed in partnership with institutes specializing in coating and film casting technology. We have also worked in close cooperation with TSE TROLLER, manufacturer of dies for pre-metered coating.

Key benefits of the IPCO Venturi dryer

- Prevention of skin formation.
- Thickness profile to precise tolerances.
- Formation of a homogeneous laminar flow.
- Elimination of faults and imperfections.
- Two-dimensional homogeneous drying profile.
- Minimized thermally-induced shrinkage.
- Significant increase in product quality.
- Significant increase in heat transfer performance.
- Significant reduction in drying section length.

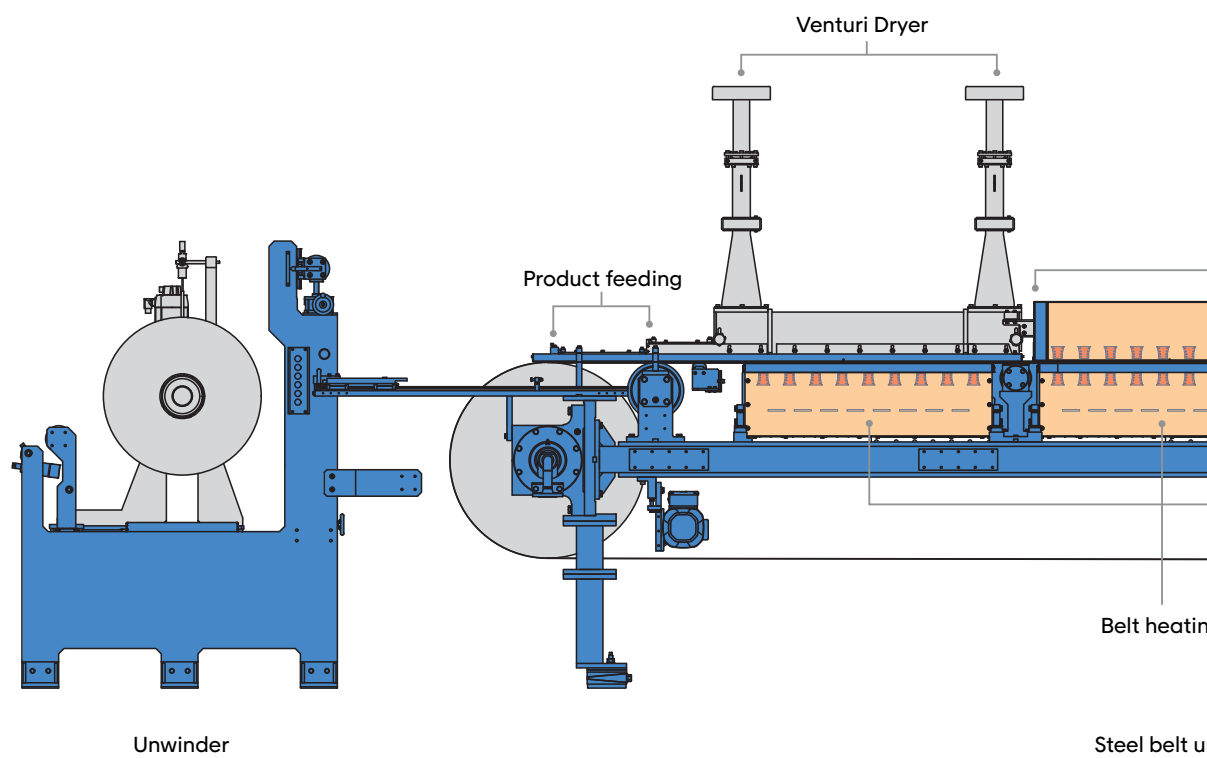
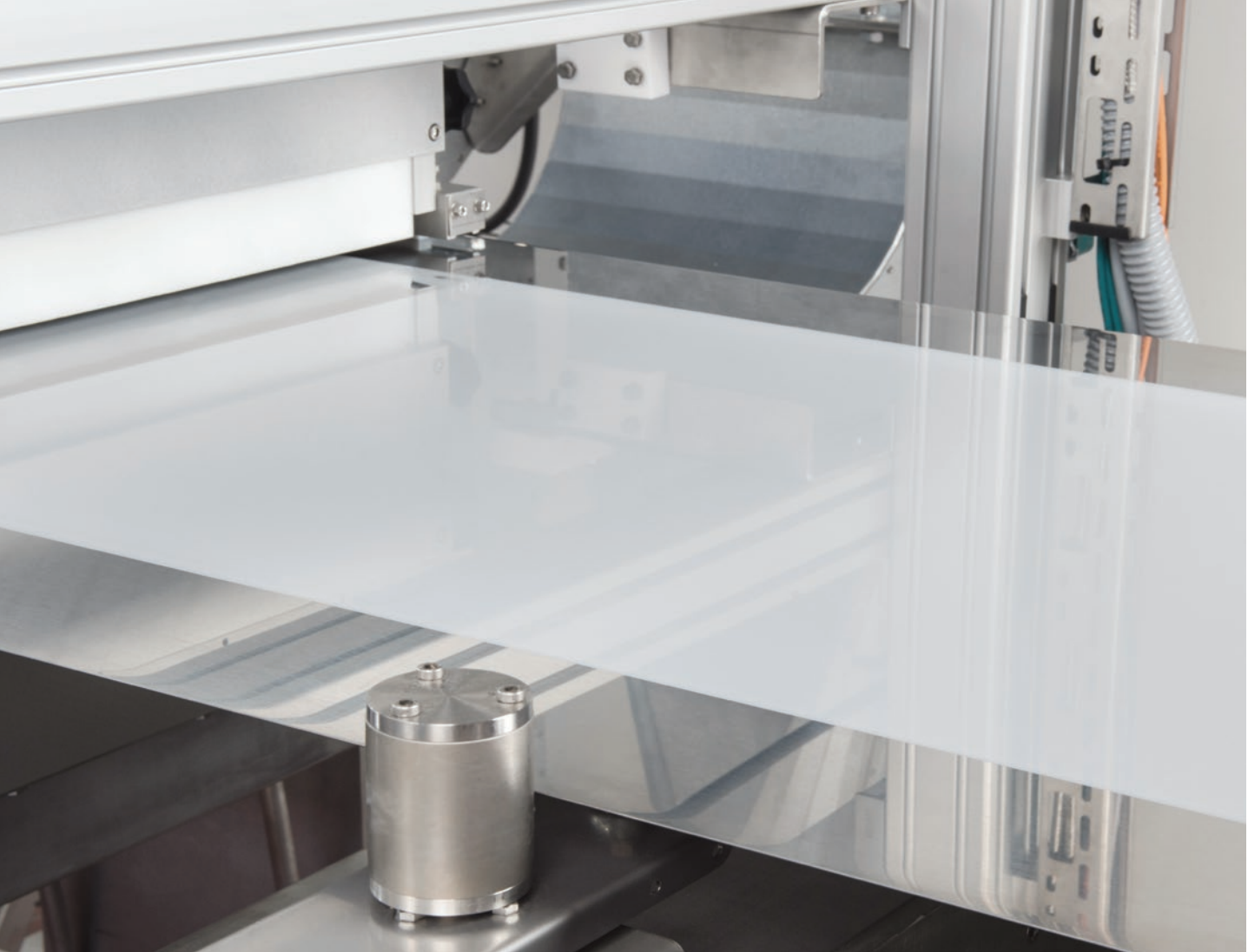




The IPCO Venturi dryer unit optimizes the evaporation process of the solvents in the casting solution. It enables the production of very thin films of the highest quality, preventing skin formation and eliminating costly faults and imperfections.

IPCO can design and manufacture complete lines for the production of various types of film and membrane products.





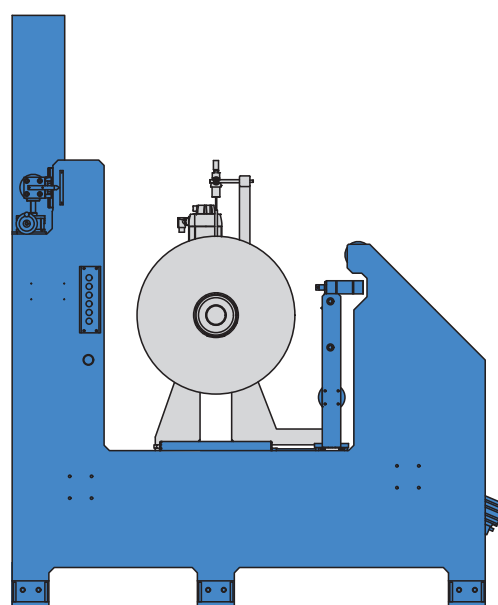
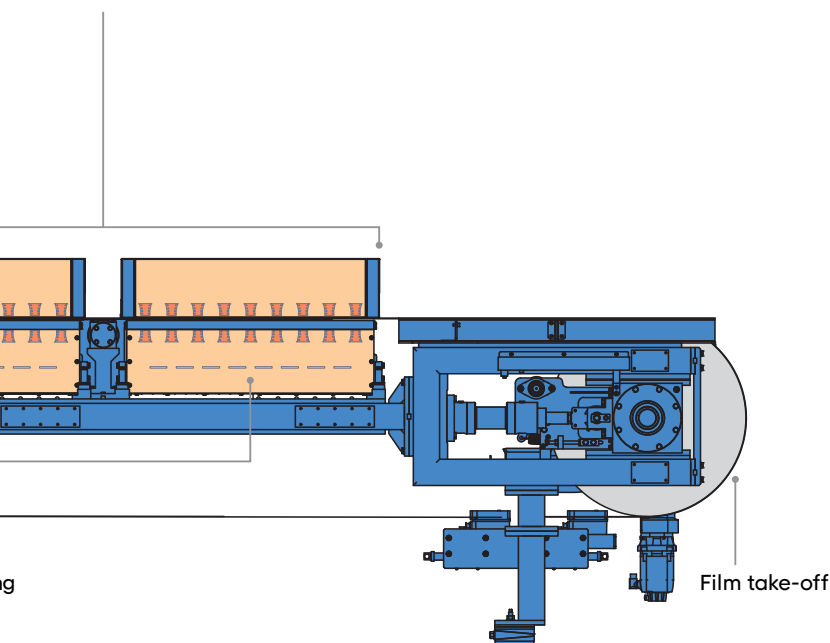
Test your products on our pilot plant

Our innovative dryer technology supports a range of potential casting applications and will also deliver significant benefits when used in conjunction with other drying technologies.

The development of the IPCO Venturi dryer represents a major step forward in drying technology and we invite you to put it to the test on your own products. We have a film casting system available for process assessment

and product testing at our Productivity Center near Stuttgart, Germany, and our technicians and engineers are available to provide full support in terms of mapping the process in batch mode.

Impingement dryer



Winder



— VENTURI — DRYING — — SYSTEM — FOR — — CONTINUOUS — — FILM — CASTING —

