

02/2017

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Cologne /Germany

# EXTRUSION

INTERNATIONAL

DIGITAL



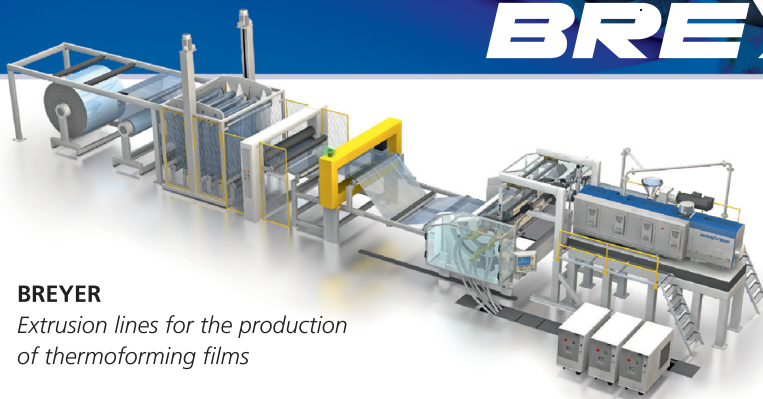
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of thermoforming films*

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## The NEW generation of cutters for profiles



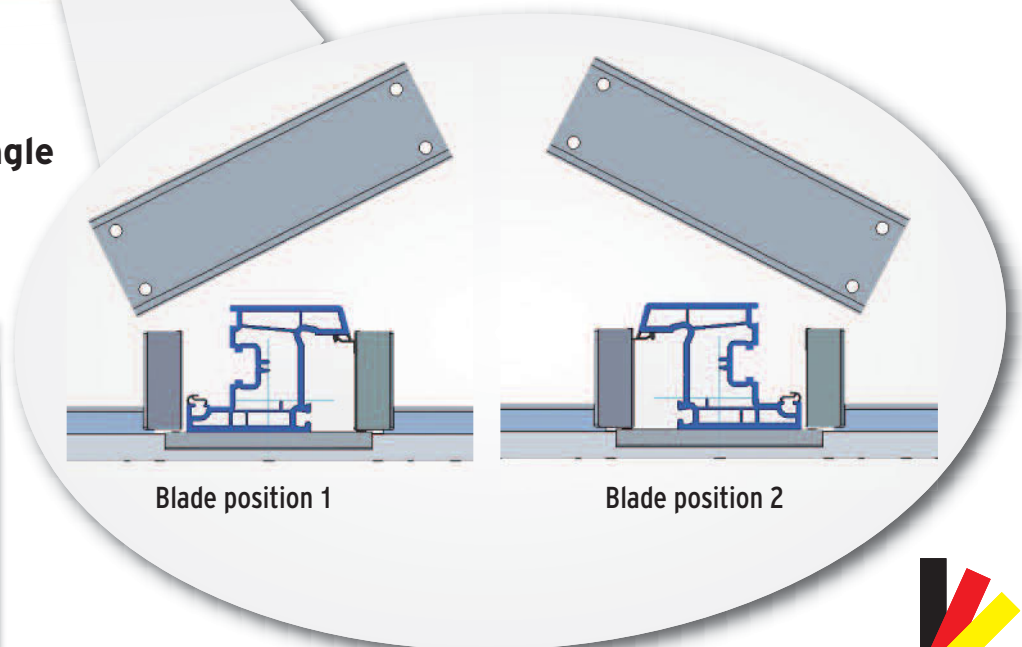
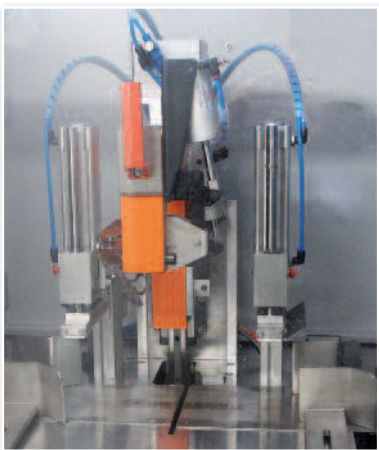
- Mirrored changing of the cutter angle during running production
- For optimised cutting of the respective profile
- Changing within 10 to 15 seconds, between two cuts
- Without loosening screws, by hand, with pneumatic clamping device using two retaining cylinders
- Sensational price thanks to increasing demand and manufacturing in large quantities

The cutter was manufactured for the first time in 1998 and in constant use throughout the world. They offer the absolute best cutting quality for glass strips, small profiles, main profiles and technical profiles.

Additional devices such as automatic film wrapping, measurement wheels for precise length determination or lettering with inkjet or laser printers can be attached.

**PTW-200**  
changeable cutting angle

Cutting Unit



Blade position 1

Blade position 2



Made in  
Germany



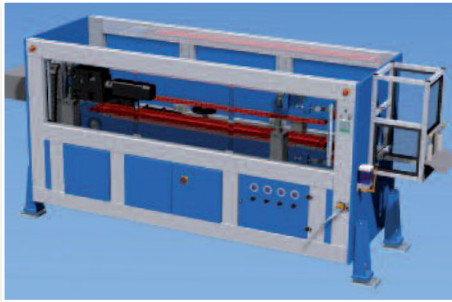
# EQUIPMENT FOR EXTRUSION



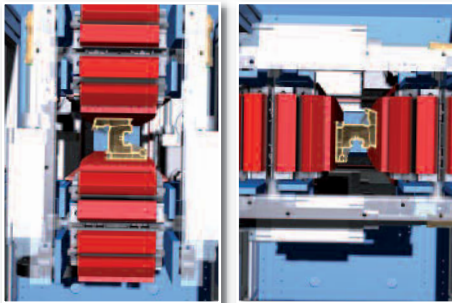
## FOR PROFILE EXTRUSION LINES



Calibration table KTS 01,  
rear



Caterpillar  
Haul off



Haul off  
rotating 90°



PRO 63  
automatic stacker

## FOR SHEET EXTRUSION LINES



Calender



Roller withdrawal AZ 8,  
outlet side



Slitting RB 2 with four  
sawing stations



Transverse separating  
cutter QSS, inlet

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The X-ray measuring system X-RAY 6000 PRO measures precisely and in real time the wall thickness, the inner and outer diameter and eccentricity of up to 3 layers of different material.

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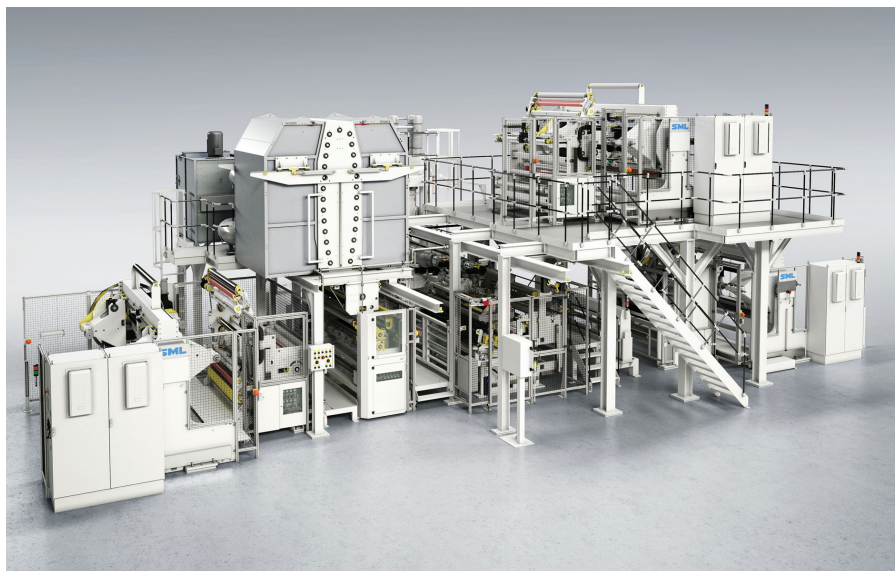
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Maag, a leading manufacturer of gear pumps, pelletizing and filtration systems, and pulverizers for demanding applications in the plastics, chemical, pharmaceutical and food industries, is pleased to announce that it will be displaying a number of its technologies at Chinaplas 2017.

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Flexible products constitute one of the fastest growing segments in the packaging industry and SML's commitment to this high-potential area is reflected by its innovative and skilfully engineered FlexPack® co-extrusion coating and laminating line.

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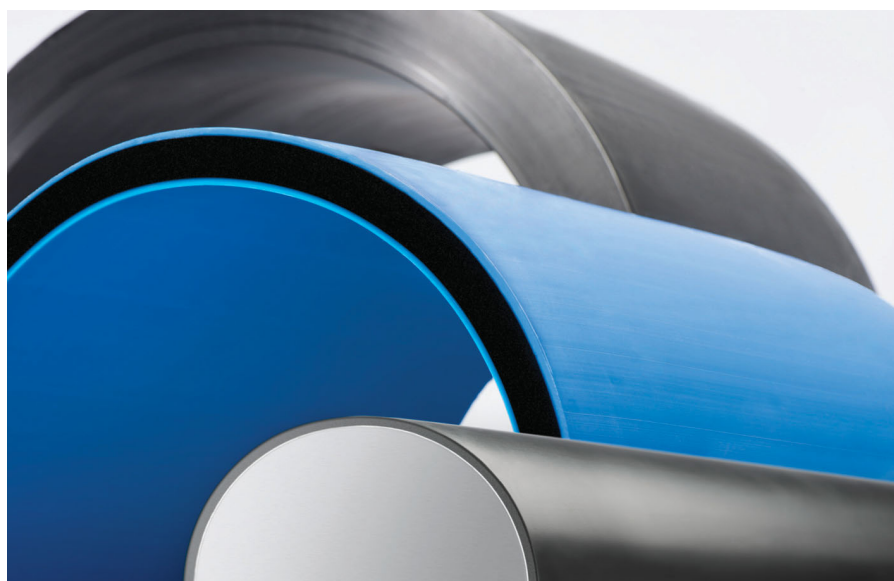
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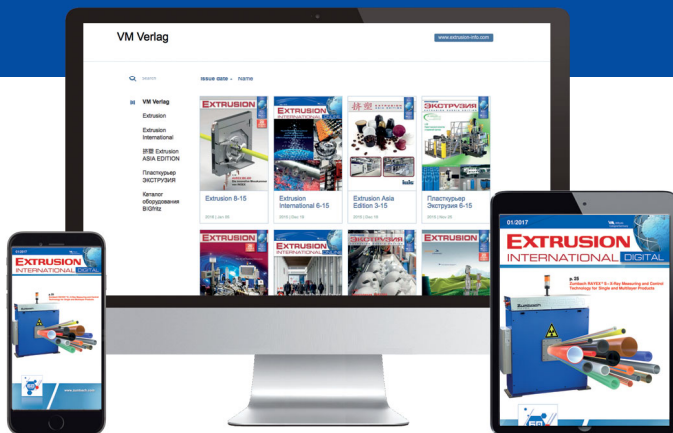
With the FDC line from battenfeld-cincinnati, changeover to different pipe dimensions currently takes about 20 min at Emtelle's plant and change to a different automatic dimension range is possible within one shift.

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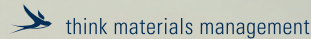
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#### INTERPACK 2017

Processes and packaging trade fair  
4. - 10. 05, Düsseldorf / Germany  
[www.interpack.com](http://www.interpack.com)

#### SOLIDS Dortmund 2017

Trade show for granules, powder  
and bulk solids technologies  
10. - 11. 05, Dortmund / Germany  
[www.easyfairs.com/schuettgut-de](http://www.easyfairs.com/schuettgut-de)

#### PLASTPOL 2017

International Fair of Plastics and  
Rubber Processing  
23. - 26.05, Kielce / Poland  
[www.targikielce.pl](http://www.targikielce.pl)

#### CHINAPLAS 2017

International Exhibition on Plastics and  
Rubber Industries  
16. - 19. 05, Pazhou,  
Guangzhou / PR China  
[www.ChinaplasOnline.com](http://www.ChinaplasOnline.com)

#### IPTF 2017

5th International Polymer  
Technology Forum  
13. - 14. 06, St.-Petersburg / Russia  
[www.iptf.ru](http://www.iptf.ru)

#### FIP Solution Plastique

The Plastics Industry Exhibition  
13.-16.06.2017, Lyon / France  
[www.f-i-p.com](http://www.f-i-p.com)

#### Equiplast 2017

The International Plastics  
and Rubber Event  
01. - 05. 10, Barcelona / Spain  
[www.messe-barcelona.de](http://www.messe-barcelona.de)

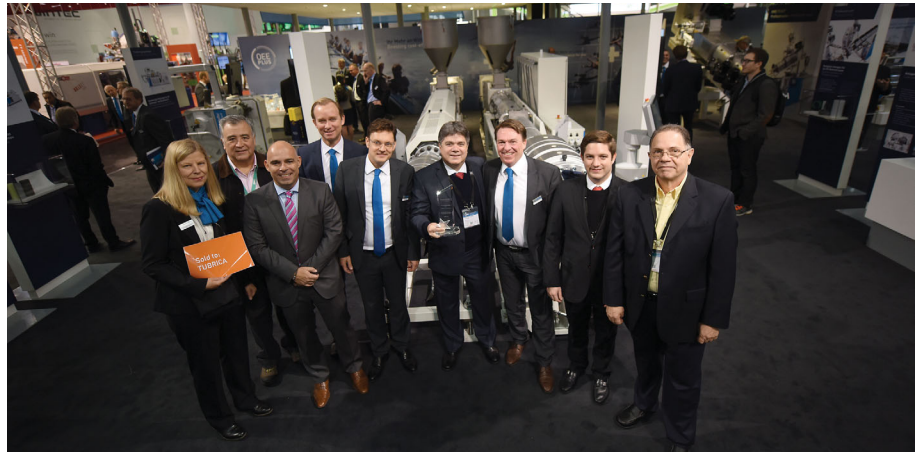
#### FAKUMA 2017

International trade fair for plastics  
processing  
17. - 21.10, Friedrichshafen / Germany  
[www.fakuma-messe.de/en/fakuma/](http://www.fakuma-messe.de/en/fakuma/)

#### COMPLAST- SOUTH AFRICA

Complete Plastics Exhibition  
16. - 18.11, Johannesburg,  
Republic of South Africa  
[www.complastexpo.in/southafrica/](http://www.complastexpo.in/southafrica/)

## For pipe production in Venezuela



■ Tubrica, one of the largest pipe producers on the South American continent, with headquarters in Venezuela, invested in the expansion of its PO and PVC pipe production as part of a large-scale order from KraussMaffei Berstorff. The systems (a total of ten lines and two single extruders) are being successively put into operation at the locations in Barquisimeto and Valencia as well as Maracaibo (Venezuela) by the middle of 2017.

#### *Premium quality and innovative products in polyolefin pipe processing*

The bundle of orders includes seven entire machines for producing pipes with polyolefin material such as HDPE and PP-R, but also lines for manufacturing innovative composite pipes, which are used in the high-pressure range in the oil and gas industry. Andreas Kessler, General Sales Manager of KraussMaffei Berstorff at the Munich location, emphasizes, "For this project we are using our proven single-screw series and sophisticated pipe head technology, but we are also providing Tubrica with specific solutions for innovative materials and processes." The systems for composite pipe production are going into operation in Maracaibo. With OEE Plus, the company offers premium-quality solutions to its customers in order to increase overall equipment efficiency (OEE).

#### *High-performance system for producing standard PVC pipes*

In addition to the PO systems, the order size includes multiple extruders for manufacturing corrugated PVC tubes, a few lines for manufacturing PVC pipes, as well as two double-strand systems for manufacturing U-PVC sewage pipes (for the diameter range from 63 to 160 mm). "The design of the double-strand lines features impressively low space requirements," Kessler explains. "With the combination of two KMD 108-36/R twin-screw extruders, we are offering the customer a custom solution that enables extremely space-saving, extremely high-performance and very energy-efficient production. It is an interesting solution when you need to produce standard pipes with large dimensions while also raising the profit margins somewhat," Kessler says. The system, which could be seen at K 2016 before being delivered to the customer, proves that customized concepts can be used to reduce production costs and increase overall equipment efficiency for the long term.

Tubrica, one of the leading pipe producers in South America, has an annual production capacity of approximately 90,000 tonnes and mostly supplies customers in the South American market.



What you need? **More Power**. WEBER have developed the High Performance series NE 40 D especially for the production of polyolefin pipes. It **offers** four powerful extruder models

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NE 5.40

# The NE 40 D series:

Maximum performance for polyolefin pipe extrusion

WEBER have been building grooved bush extruders for more than five decades. A unique High Performance range was developed especially for extrusion of HDPE and PP pipes.

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- // Long service life of grooved bush and processing unit through lower grooved bush pressure
- // Constant output across the entire speed range
- // Lowered melting temperature compared to older machine concepts
- // Output increase by up to 40 per cent
- // Reduction of energy consumption
- // Reduced water cooling of the grooved bush and new drive concept (WEBER GREEN TECHNOLOGY)
- // Torque motor optional



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en/pipe](http://extrudertechnologie.de/en/pipe)



## Transam Extrusions Continues to Invest in Davis-Standard Technology

■ The United Kingdom's market leading tubing & profile manufacturer, Transam Extrusions Limited, continues to invest in Davis-Standard extrusion equipment. Transam, based in Barton-Le-Clay, Bedfordshire, United Kingdom, has experienced significant growth over the past decade and is regarded as one of the UK's leading plastic pipe manufacturers, producing a wide range of both flexible and rigid plastic pipes and profiles up to 180 mm wide.

The relationship between the two companies has grown over the past decade, and has included investment in new Davis-standard extruders, screw technology and other downstream equipment to support the company's growing business.

"Davis-Standard's expertise, dedication and responsiveness to their customers goes beyond all expectations," said Russell Brazier, Managing Director, Transam. "Their equipment is extremely reliable, screw technology second to none and we've been delighted with the technical staff that support and help us to concentrate on our growing business in the United Kingdom."

Most recently, Transam added a new Davis-Standard EB50 EuroBlue extruder. The EB50 EuroBlue is the sixth Davis-standard extruder, with associated downstream, to be installed at Transam. The machine was ordered and delivered within 5 days, resulting in minimal production delays for Transam's



clients. In addition, Transam purchased a custom-built Davis-Standard water-bath specifically designed for the company's unique business requirements.

Transam operates a reinvestment program, which ensures a proportion of their annual profits are allocated for reinvestment back into their business in the form of new equipment. They are passionate about British manufacturing and are dedicated to offering their clients quality product with excellent service.

► [www.davis-standard.com](http://www.davis-standard.com), [www.transamltd.co.uk](http://www.transamltd.co.uk)

## SIKORA LASER diameter gauges determine the wall thickness

■ Today, measuring and control technologies are an industrial standard in hose extrusion lines with focus on quality control, process optimization and reduction of manufacturing costs. Directly integrated in the production lines, the systems measure in real time, product dimensions such as inner and outer diameter, ovality, wall thicknesses and eccentricity. A prevailing method for determining the average wall thickness is the diameter differential method. From the values of two diameter measuring devices the wall thickness is calculated.

40 years ago, the first SIKORA wall thickness measuring devices called ISOWAND based on the principle of differential measurement, were used in insulating and sheathing lines. Today, the measurement of the average wall thickness as well as the control of extruder rpm and line speed are still attractive methods for quality assur-

ance and process optimization in hose extrusion lines.

At the extrusion of hoses, typically a mandrel is used. For the differential measuring method, the diameter of the product is measured contactless after the extruder by a SIKORA diameter gauge head (LASER Series 2000/6000). The evaluation is realized in combination with the processor controlled display and control systems ECOCONTROL 1000 or 6000, whereby, the diameter of the mandrel is preset in a recipe. The wall thickness is calculated from the difference of the hose diameter measured in real time and the predefined diameter of the mandrel.

The material shrinkage is already considered in the wall thickness measuring value. The shrinkage value is proportionally defined by the operator or automatically calculated by an additional diameter gauge head at the end of

the line from the hot/cold values of the diameter with the Hot/Cold Control Module HC 2000.

The differential measuring method is also used in multi-layer extrusion processes. The wall thickness is hereby calculated from the difference of the outer and inner diameter of the hose measured in real time.

For extrusion lines where in addition to the wall thickness eccentricity values of the product are required or where a wall thickness determination by means of a differential measurement is inconvenient due to the material composition, the use of the X-ray measuring system X-RAY 6000 PRO is recommended. This measures precisely and in real time the wall thickness, the inner and outer diameter and eccentricity of up to 3 layers of different material. A control of the measuring values is achieved in combination with the processor system ECOCONTROL 6000.



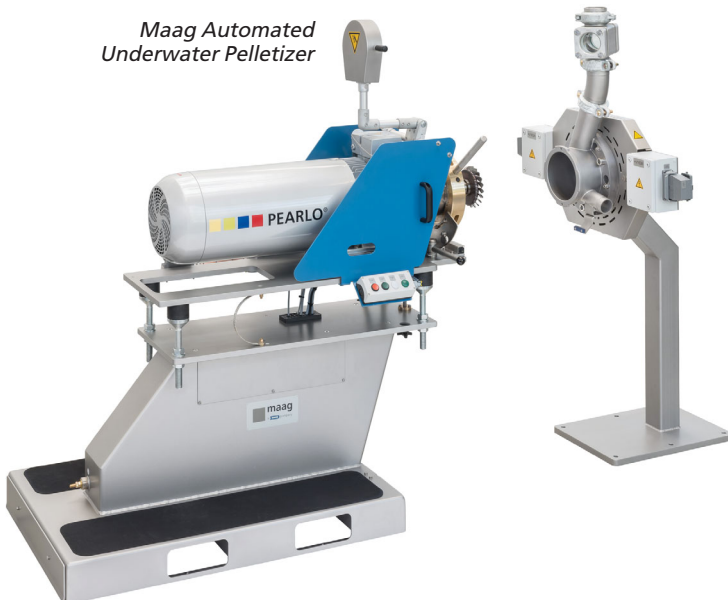
From the values of two diameter measuring devices the wall thickness is calculated

► [www.sikora.net](http://www.sikora.net)

## Maag Set To Display New Product

■ Maag, a Dover company and worldwide leading manufacturer of gear pumps, pelletizing and filtration systems, and pulverizers for demanding applications in the plastics, chemical, pharmaceutical and food industries, is pleased to announce that it will be displaying a number of its technologies in Booth S61 in Hall 5.1 at Chinaplas 2017, which will be held from May 16-19 at the China Import & Export Fair Complex in Guangzhou, China. The highlight of the show for Maag will come when the company unveils its new ZHULI Underwater Pelletizing System. The ZHULI system combines Maag's best existing pelletizer, water-box bypass, process water and dryer technologies. Other Maag products that will be on display at Chinaplas 2017 include:

Maag Automated Underwater Pelletizer



-PEARLO® Underwater Pelletizer: Designed to process spherical pellets for raw materials, compounds, masterbatches, engineering plastics, wood and nature filler-filled polymer composites, thermoplastics elastomers, hot-melt adhesives and gum bases at capacities that can reach 36,000 kg (79,200 lbs.) an hour

-CSC Series Screen Changers: Features a double-piston design that allows tailor-made adjustment of the filtration unit per the user's specific process requirements while allowing the use of five different filter-cavity shapes within the same screen-changer housing: circular, oval, arched, leaf-disc and candle

-x6 class Gear Pump: Offers improved volumetric efficiency and pressure capabilities that allow it to be operated at reduced rpms, shear rates and temperatures, resulting in reduced residence time and energy consumption with improved production rates, polymer quality and pump life cycle

-BAOLI S Strand Pelletizer: The BAOLI S builds on the standard-setting BAOLI pelletizer model with its innovative automated cutting chamber interlock system able to deliver increased performance, higher productivity and reliability, improved handling, greater flexibility and an optimized cost/benefit ratio in critical strand-pelletizing applications.

"We are honored to have the opportunity to display Maag products at Chinaplas 2017. We feel that our products help to meet the show's goal of featuring the latest high-tech materials, smart-manufacturing systems and green solutions for China's plastics and rubber industries, especially with the unique line up of Maag products on display at this year's show," said Paul Merich, VP/GM of Maag Greater China.

► [www.maag.com](http://www.maag.com)



## DC-A Control Extended to Mid-Size Conair Dryers

■ The DC-A dryer control, first launched in late 2016 on smaller Conair Carousel® Plus dryers and MDCW mobile drying/conveying systems, is now available on mid-sized dryers and has been further enhanced with remote access via Virtual Network Computing (VNC). This new capability, not previously available on the DC-A control, means that users can interface with the control using any Internet-connected device from virtually anywhere just as if they were standing in front of the dryer on the plant floor. Any operation that can be performed on the dryer interface – monitoring conditions, changing settings, responding to alarms, troubleshooting or downloading process data – can also be performed remotely.

The DC-A control is based on the well-known Allen-Bradley micro 850 PLC platform that supports many advanced capabilities. It has a 7-inch color display with intuitive graphical design, minimal text and no function codes to decipher. It provides descriptive help screens for operators and features auto-start capabilities, password protection and has Conair's Drying Monitor capabilities built in. Trending capabilities simplify maintenance and troubleshooting, while providing users with information they can use to optimize drying parameters and save energy.

*The DC-A dryer control is now available on mid-sized Conair dryers and MDCW mobile drying/conveying systems. It has been further enhanced with remote access capabilities*



The new DC-A control is standard equipment on Carousel Plus dryer Models 15 to 300, and on MDCW Models 15 to 200. Carousel Plus Models 150 to 400 are available with either the DC-A control or the DC-T, which has a larger touch screen. It can manage multiple drying configurations, like the Resin-Works® central drying systems, and includes a range of communication options.

► [www.conair.com](http://www.conair.com)



High overall equipment efficiency (OEE) is a fundamental prerequisite for your company's success. KraussMaffei Berstorff's product portfolio therefore comprises tailored machines and lines along with perfectly matched services that increase the economic efficiency and the sustainability of your production.

Chinaplas, hall 5.1, booth J41

[kraussmaffeiberstorff.com/oe](http://kraussmaffeiberstorff.com/oe)

# OEE Plus Boosting cost-efficiency for you

Engineering Value

## KraussMaffei Berstorff

## Zumbach Electronics at the Wire Russia 2017

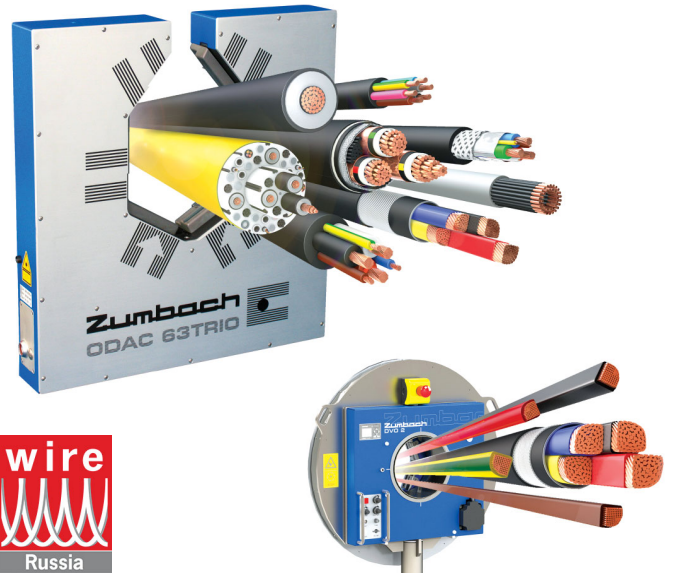
■ It will be a pleasure to meet you in Moscow at our booth FO B46, where we will be able to give you detailed information about our wide range of measuring & control solutions for process monitoring, quality control and cost-effective production. Our Team will be delighted to provide information about our complete product range, among others:

### Sensors

- 1, 2 and 3 axis ODAC® diameter gauges for any cable and wire and any budget.
- Besides the complete line of these diameter gauges, new models with special beam geometry, fault detection function and super fast scan rate will be exhibited.
- MSD gauges diameter and ovality with "Multi-Source Device Technology.
  - The advanced ODEX® concentricity and diameter gauge for wire extrusion. Fully non-contact, based on magnetic and laser technology.
  - New ultrasonic wall thickness and eccentricity scanners of the UMAC® series with quick and easy adaptation to cable diameters and space-saving integration.
  - Unique PROFILEMASTER® profile and shape measurement systems using light section principle and machine vision
  - State-of-the-Art Spark Tester systems
  - Advanced KW lump/neckdown detectors with a unique measuring principle and complex optics solution

### Data Acquisition, Processing and Display Units (Processors)

- Modular high performance data acquisition, processing and display units of the USYS IPCe series.



### Complete Measuring and Control Systems

- RAYEX® D and RAYEX® S series: Dynamic and Static X-Ray measuring & control system for CV lines, for wall thickness (3 layers), eccentricity and diameter/ovality for CV lines.
  - WALLMASTER / UMAC® – DIACAL Systems: Ultrasonic wall thickness and eccentricity systems for cable jackets and DIACAL option for fully automatic calibration and control.
- We are looking forward to welcome you at our booth.

► [www.zumbach.com](http://www.zumbach.com)

## Robert Dages Joins Davis-Standard as Aftermarket Regional Sales Manager

■ Davis-Standard, LLC is pleased to announce the appointment of Robert Dages to Aftermarket Regional Sales Manager working for the Circonix Division. In his new role, Dages will



*Robert Dages Davis-Standard Aftermarket Regional Sales Manager*

focus on aftermarket sales of converting equipment for the Wisconsin, Minnesota, and other select mid-west customers. Prior to joining Davis-Standard, Dages worked as Senior Vice President for the North American division of a leading converting machinery manufacturer. He also managed sales and marketing for the supply of coating and laminating lines.

"Dages brings extensive sales experience with coating and laminating processes and equipment," said Andre Icso, Davis-Standard Vice President of Global Aftermarket Sales. "His extensive experience will prove to be an invaluable asset to our sales team."

► [www.davis-standard.com](http://www.davis-standard.com)



# GRAFE at the VDI Mannheim

■ Innovative ideas for efficient and high-quality plastic applications in cars has been presented by the plastics specialist GRAFE from 29th to 30th March 2017 at the international VDI Congress "Plastics in Automotive Engineering". The automotive competence of the Thuringian company is particularly in focus since the GRAFE Color Batch GmbH is the only German company that is certified in accordance with ISO / TS 16949 for the manufacture as well as development of color masterbatches. This certification unites all worldwide published quality standards and requirements of the automotive industry for quality management systems to date, and documents the ongoing growth strategy of the GRAFE Group as an international supplier of masterbatches and compounds.

In addition to the industry-independent requirements of the ISO 9001 for quality management systems, the ISO / TS 16949 certification means that GRAFE fulfills the additional requirements for series and spare part production in the car industry as a link in the automotive value-added chain. The certification testifies to the unique selling point of the Blankenhain company as German wide developer and manufacturer of masterbatches. It represents an important goal of the GRAFE Group to maximize customer satisfaction through improvements in system and process quality. This



includes the early detection of potential dangers and faults in both production and in the supply chain, along with the elimination of these error sources through timely corrective measures.

In cooperation with its customers over the past years, GRAFE has developed over 1,000 automotive colors in more than 40 types of thermoplastics for over 39 OEMs. Renowned national and international car makers are convinced by the quality and flexibility that GRAFE offers them as customers.

Masterbatches, however, do have their limits when it comes to certain applications and this is where the GRAFE Group can provide customized compounds in all interior colors for every type of thermoplastic. Even for relatively small amounts of only 100 kg per color in a series, the GRAFE Group can develop all compounds with the desired properties in any color.

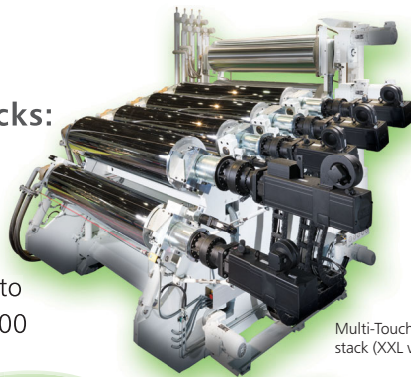
► [www.grafe.com](http://www.grafe.com)



## Cutting-edge extrusion solutions for thermoforming sheet production

### Multi-Touch roll stacks:

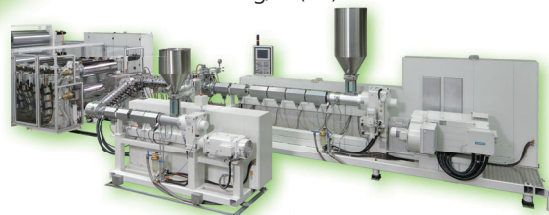
- Lowest tolerances in the industry
- Excellent sheet quality
- Enormous outputs of up to 3,300 kg/h (PET) & 3,300 kg/h (PP)



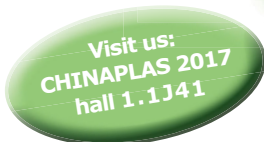
Multi-Touch roll stack (XXL version)

### High-speed extruders:

- 15 – 20 % energy savings
- Improved product quality
- Easy handling & less space requirement
- Outputs of up to 1,500 kg/h (PP) & 1,750 kg/h (PS)



Co-extrusion line with high-speed extruders & Multi-Touch roll stack



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## Launch of five-strand laboratory LFT lines for end users

■ ProTec Polymer Processing will launch five-strand laboratory LFT lines for developing high quality long-fibre-reinforced thermoplastics by pultrusion at this year's Chinaplas from 16 to 19 May 2017 in Guangzhou. These Industry 4.0 capable lines with complete materials handling capabilities are equipped with the new user-friendly SOMOS® control/excellence controller. Such laboratory lines allow LFT compound manufacturers to be more responsive by permitting on-site development, testing and reliable scaling up of their formulations, so minimising downtime.

### *From lab to production*

An investment in the future, the laboratory lines allow LFT compounders to be more flexible and independent. By developing their own formulations in-house in parallel with ongoing production, line users can respond more rapidly to market requirements.

The laboratory lines have a narrower die width and are designed to handle five glass fibre or three carbon fibre strands. Otherwise, the design of the modules and their complete integration with materials handling components are the same as in ProTec's conventional pultrusion lines. A keystone of the line is a high-performance underfed compounding extruder equipped with a SOMOS® Gramix S gravimetric dosing system capable of accurately dosing and mixing up to seven components. As a result, a very wide range of individual formulations of the polymer matrix can be produced very flexibly directly in the process.

The new user-friendly Industry 4.0 capable SOMOS® control/excellence controller means all modules can simply be selected centrally via a touch screen operator console: line speed, throughput of the underfed extruder and pellet chopping length can all be varied. SOMOS® systems for drying, conveying, dosing and mixing the various material components are also integrated into the line controller. USB and SD ports



mean that up to 1,000 custom formulations can be saved and reliably transferred to production. Because SOMOS® controllers are used for both the laboratory and the production lines, production parameters can be straightforwardly transferred, so minimising downtime due to product changeovers. With their remote control function and internet access, the lines can be remotely serviced, optionally also via a WLAN hotspot.

### *Versatile technology for high quality LFT compounds*

ProTec's LFT technology is suitable for producing a wide range of materials comprising variable fibre reinforcement in a defined pellet length and using different polymers as the matrix. The lines are capable of producing LFT pellets with fibre contents of up to 65 wt.% at throughputs of up to 1,000 kg/h. Any conventional thermoplastics, including biopolymers such as PLA (polylactic acid), may be used as the matrix. Recycled material and additional fillers may likewise be included in the material formulation. Glass, steel, carbon or aramid fibres can be used for reinforcement. Even the extremely difficult pairing of carbon fibres with PP can be reliably processed. In practice, LFT materials with fibre lengths of 7 mm to 15 mm are conventional. When injection moulded, LFT compounds with fibre reinforcement along the length of the pellets result in components which combine high strength and light weight with very good surface quality, as is most particularly required in the automotive industry.

► [www.sp-protect.com.cn](http://www.sp-protect.com.cn)

## Klößner Pentaplast to present Pentafood® Hotfill PET

■ Klößner Pentaplast will present Pentafood® Hotfill PET at CFIA 2017 in Rennes (France). Klößner Pentaplast will also show a wide range of high-performance films at the CFIA. Pentafood® Hotfill PET is an attractive hot-fill solution for the food packaging industry. Pentafood® Hotfill PET combines increased heat resistance with the excellent transparency of a PET film. Plus, this film is recyclable and meets the growing demand for highly secure packaged goods made with sustainable materials. "The food market's growing desire for more sustainable packaging, coupled with brand owners' ongo-

ing creative approaches to increasing the attractiveness of their products on shelves, positions Pentafood® Hotfill PET as a valuable film choice that also solves the growing need for hot-fill applications", says Roberto Santos, Marketing Director Food & Consumer Packaging EMEA.

Pentafood® Hotfill PET supports an increased temperature resistance to 90°C/ 194°F. At the point of sale, consumers will see glossy packaging with excellent transparency that allows for instant and clear visibility of the product contents.

► [www.kpfilms.com](http://www.kpfilms.com)

## The best of both worlds: "Flowing Metallics"

■ The strong cooperation between effect pigment specialist Schlenk Metallic Pigments GmbH in Roth and masterbatch manufacturer Gabriel-Chemie GmbH in Weitnau has succeeded in reproducing an astonishingly authentic metallic look in plastics. The masterbatch formulas developed by Gabriel-Chemie with ultra-fine pigments from Schlenk create a silky, homogeneous surface on the plastic object by means of mass colouration. The surface is free from visible glitter particles and characterised by an intense deep gloss, especially for high-gloss surfaces. The exclusive small series of "Flowing Metallics" was created in ten elegant, distinguished colours as samples in a PP polymer and forms part of the current Colour Vision N°17.

Ulf Trabert, Product Manager Branded Goods at Gabriel-Chemie is convinced: "This type of perfect surface can be cost-effectively achieved through mass colouration. We have adopted a unique position of quality in the metallisation substitution sector with our formulas and the high-grade effect pigments from Schlenk."

The masterbatch can be used in many polymers and has already been successfully tested in a wide range of manufacturing processes. It is also approved for contact with food. This alternative offers benefits in packaging processing for numerous plastics packaging manufacturers, especially in the cosmetics industry, as additional logistical tasks and production steps can be omitted by doing away with the need for metallisation. All the benefits of plastic packaging are retained, including the higher breakage resistance compared to other materials. The masterbatch for all colours of the "Flowing Metallics" series can be used not only for cosmetics packaging but also for food packaging, household products and in the sports industry, and also turns lifestyle products into exclusive eye-catchers.



www.gabriel-chemie.com



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## ICE Europe 2017 closes with increase in international attendance

■ The 10th International Converting Exhibition, ICE Europe 2017, closed its doors, after three successful show days full of international business activities, networking and live demonstrations of the latest converting solutions.

Once again, ICE Europe was a magnet for converting specialists from all over the world. A total of 6,850 visitors from 68 countries attended the show. With 429 exhibitors from 28 countries, covering a net exhibition space of 11,000 m<sup>2</sup>, this year's ICE Europe remained unchanged with respect to size compared to the previous show.

A first analysis of the exhibitor feedback shows that a vast majority of the participating companies were highly satisfied with the results of this year's exhibition. They praised the high quality of trade visitors and reported large numbers of international business contacts. 45% of exhibitors and 49% of visitors were from outside Germany; an all-time record in international attendance. The biggest exhibitor countries after Germany were Italy, Great Britain, Switzerland, the USA, France and the Netherlands. Top ten visitor countries were Germany, Italy, Austria, Poland, Switzerland, Great Britain, France, Spain, the Czech Republic and the Netherlands.

The first analysis shows that visitors mainly belonged to the following industry sectors: packaging, plastics, printing, paper, engineering, textiles / nonwovens, chemicals and automotive. When asked about their main areas of interest at the exhibition, visitors stated coating/laminating, slitting/

rewinding, accessories, materials, control/test and measurement, printing, finishing and drying/curing.

### ICE Europe 2017 Awards

To celebrate the 10th edition of ICE Europe, exhibition organisers Mack Brooks Exhibitions awarded prizes to four exhibiting companies for best practice, excellence, innovation and extraordinary performance in the converting industry. The ICE Jubilee Awards were presented on the first exhibition day. The winners had been chosen through an online vote of the converting community via the exhibition website. A total of 39 entries from participating companies were shortlisted and some 1,300 converting specialists took part in the online voting and selected the winners in the four award categories Converting Solutions for New Materials, Industry 4.0, Green Technology and Innovative Partnerships.

Winning company in the category 'Converting Solutions for New Materials' was Infiana Germany for their innovative antistatic release films.

Companies which participated in the category 'Industry 4.0' had developed systems for digitalised production processes in the converting industry. The winner in this category was Derichs GmbH for their new ED-1 system that delivers data in real time.

In the category 'Green Technology' Applied Materials Web Coating GmbH received the award for their TopBeam platform using electron beam evaporation and offering a solution for applying transparent coatings with improved clear barrier performance for a variety of oxide materials.

Kampf Schneid- & Wickeltechnik's Converting 4.0 network was selected to receive the award in the category 'Innovative Partnerships'. The open Kampf Converting 4.0 network was presented at ICE Europe 2017 for the very first time. Companies of the network starter group are KAMPF, BST eltromat, Neuenhauser Vorwald, Paul&Co, Codecentric and XYQOM.

### Dates for the next show

Most of this year's exhibitors have already indicated on-site that they intend to exhibit again at the next International Converting Exhibition in Munich. ICE Europe 2019 will take place from 12 - 14 March 2019 at the Munich Trade Fair Centre.

The next exhibition in the ICE series of dedicated trade events for the converting industry will be ICE USA, held from 25 - 27 April 2017 in Orlando, Florida. Next year, Mack Brooks Exhibitions will organise ICE South East Asia, from 5 - 7 September 2018, in Bangkok, Thailand.





## Ettlinger's high performance melt filters in Turkey

■ Ettlinger Kunststoffmaschinen GmbH, the manufacturer of high performance melt filters and injection molding machines for high shot weights, has further expanded its worldwide sales network. Since the fall of 2016, P2B Engineering & Consultancy of Istanbul has been responsible for marketing Ettlinger melt filters in Turkey. Established by Managing Director Mustafa Öztürk in 2016, the company is an application oriented provider of solutions for the recycling, packaging and automotive sectors. Mr. Öztürk can draw on extensive and longstanding experience in the industry. Among other things, he spent eleven years as a design engineer for plastic parts used in household appliances as well as some ten years in international business management and sales for high quality injection molding systems.

### *Ettlinger's patented melt filters ...*

... are designed to operate continuously and can be incorporated into almost any extrusion line. At the heart of these filters is a rotating filter drum with perforations through which the contaminated melt flows from the outside to the inside. A scraper continuously removes the contaminants that are

held back on the surface and feeds them to an exit screw or discharge shaft. This enables the filter to be used fully automatically and without any disruptions over a period of weeks and months without having to replace the screen. The advantages of this design are the constant melt pressure, extremely low melt losses, and good mixing and homogenizing of the melts.

The ERF series, for throughputs of up to 6000 kg/h, is suitable for separating contaminants such as paper, aluminum, wood, silicones or high-melting polymer composites from heavily contaminated polyolefins and polystyrenes.

The ECO series, designed for a maximum throughput of around 3000 kg/h, has been optimized by Ettlinger specifically for complex extrusion processes such as the manufacture of films, sheets and other semifinished products, and is ideal for filtering polyolefins, PET and PA as well as recycled material containing up to 1.5% contaminants.

www.ettlinger.com,  
www.p2b.com.tr

Specialized in pipe extrusion lines

*This is not an extruder.*

*It's an idea of performance & energy efficiency.*

**TECNOMATIC**

Energy efficiency criteria is a crucial issue across manufacturing industries. Pipe extrusion is an energy intensive process and optimisation of process energy usage while maintaining melt stability is necessary in order to produce good quality product at low unit cost. Tecnomatic, with the new extruder series Zephyr, has made of this the utmost priority offering increased screw length (40 L/D) and smaller torque AC water cooled motors to assure same output of bigger machines and unprecedented energy saving.

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Tel. +39 035 310375 | www.tecnomaticsrl.net

agenziap.it

## CHINAPLAS 2017: lightweighting and smart manufacturing

■ As energy and environmental protection become increasingly important global issues, a lot of efforts have been put into lightweighting vehicles, as the reduced weight of a vehicle attributes a lot to the efficient use of energy. According to statistics, a 100kg reduction in car weight can translate into a 10% increase in driving mileage and a 15% to 20% decrease in power costs. It also helps reduce carbon emission. These factors drive the automotive industry on a quest for innovative materials and material systems that help make vehicles lighter.

### *New materials lead to lighter and stronger automobiles*

More than 1,500 exhibitors will gather at CHINAPLAS 2017 to present new materials, state-of-the-art equipment and advanced solutions to inspire the automotive industry and facilitate enterprises to explore possibilities on the journey towards lightweight and sustainability. Some of the exhibits are highlighted below. Kraiburg Tpe (Shanghai) Co. Ltd. will introduce its UV/HF/SF series in CHINAPLAS 2017. The UV/HF/SF Series is targeted towards automotive exterior components requiring high UV resistance, perfect surface finish and high flowability. It is of easy flowing, exhibits excellent processing behavior, adheres perfectly to PP with perfect surface finish and is tested according to Volkswagen PV3930 for outdoor use.

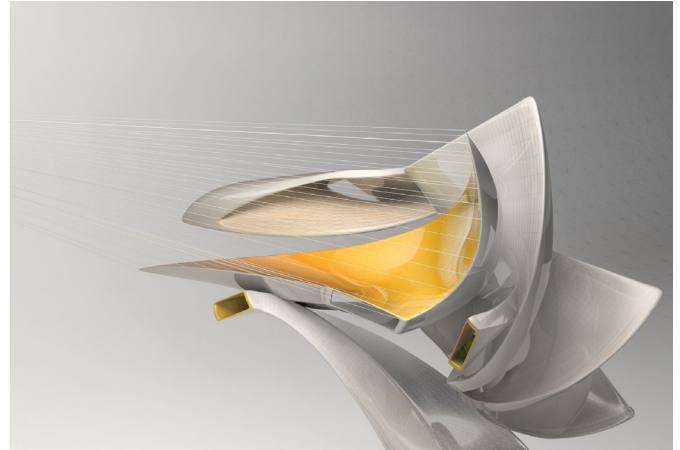
CGN Juner New Materials Co., Ltd. will introduce 65% continuous glass fiber reinforced polyamide 6 UD-tape which features high glass fiber content, high strength and modularity. The product can be applied in automotive components, such as foot pedals, seat frames, front-end frame, etc.

Polymer Science (Shenzhen) New Materials Co., Ltd. produces polyimide fiber with a wet spinning two-step production process. Compared on same molecular structure basis to the traditional one-step production process, it can increase heat resistance by nearly 100 degrees and double the strength.

### *Smart Manufacturing Technology Zone to promote automotive industry*

"Smart Manufacturing Technology Zone" will also be set up on the show floor, presenting a wealth of cutting-edge exhibits

*RN30 Concept Car jointly developed by BASF and Hyundai Motor Company*



*Autodesk Software (China) Co., Ltd. will firstly launch its Moldflow simulation software*

from leading suppliers, including Siemens, Bosch Rexroth, Delcamic Electronics, Enmair, Zhejiang Keqiang, Danfoss, Sodron, LNC, Dongguan STS, Star Seiki and more. Apart from robotic arms, automated systems, controllers, actuators and sensors that were featured in the previous editions of CHINAPLAS, visitors will have a chance to witness smart factory solutions. More cutting-edge technology can be found in the "3D Technology Zone", where 3D printers, 3D scanners, 3D printing software and 3D printing services will be displayed.

*Concurrent events to inspire automotive smart manufacturing*  
Building on the success of the first "Industry 4.0 Conference" held last year in Shanghai, CHINAPLAS will once again join force with VDMA, the German Engineering Federation, to present the "2nd Industry 4.0 Conference". The first day of the conference (May 16, 2017) is themed "Automotive 4.0". Representatives from KraussMaffei and Engel will give presentations on smart manufacturing technology and 4.0 solutions for the automotive industry. Shanghai Volkswagen Co. Ltd. will bring smart manufacturing case sharing to audiences. In addition, the key to the realization of "Industry 4.0" and "Made in China 2025", standardization, will also be discussed.

CHINAPLAS is once again co-present "Design x Innovation" with BASF, the world's leading chemical company. The theme "Smarter Living" will be demonstrated through "Inno Gallery", "Design Forum" and "TRIO", with "TRIO" represents the cooperation between BASF, designers and brand owners. Concept car RN30, an innovation that combines key solutions from the chemical industry with purposeful aerodynamic design and specialized high-performance technologies and jointly developed by BASF and Hyundai Motor Company, will be showcased in "Design x Innovation".



## Big capacity in-line thermoforming plant for Zegar cups

■ AMUT GROUP has recently supplied to P.T. Starplast Packaging Industry a complete in-line thermoforming plant to produce disposable PP cups for cold tea, working in full operation with an output of 60.000.000 cups per month. The cups have Ø 68 mm, height 114 mm and weight of reference 4 gr.

Starplast company supplies the well-known brand Zegar, part of 2Tang Group, one of the biggest producer of mineral water and cold tea in Indonesia.

The extrusion section is equipped with a 3-components dosing system and an EA130 40 L/D AMUT extruder for a capacity of 800 kg/h using 50% regrind material coming back from thermoforming process. The improved concept of the calender with 500 mm-rolls shaped for high stiffness comply with the target-product specifications, a foil in PP with 1.200 µ-thickness.

The plant is based on a thermoforming machine model AMP 850-GP, forming and trimming in one station technology with tilting movable lower platen. The mould has an area of 850 x 560 mm and 55- cavities. Closing force for forming is around 700 kN. The machine includes a fully automatic pick up stacker and a grinder to in-line recover up to 600 kg/h of thermoformed skeleton.

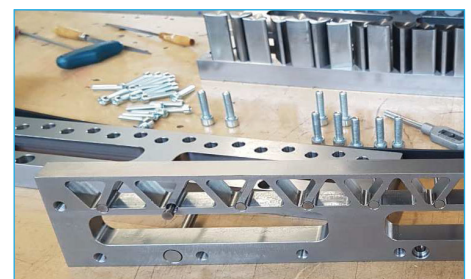
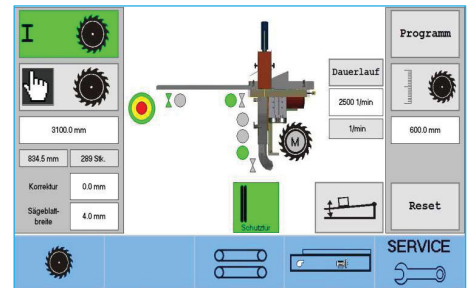


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## Performance up, production costs down

■ At Chinaplas 2017 in Guangzhou, Booth 5.1 A65, German film stretching line specialist Brückner Maschinenbau will present innovations for the cost-effective production of a wide variety of added-value plastic films.

### *High performance BOPP and BOPET packaging film lines lower the production costs*

Brückner's film stretching lines are the widest (up to 10.4 m) and fastest (above 600 m/min) and most productive (up to 65,000 tons/year) within the industry. Combined with a once more increased energy and raw material efficiency this technology lowers film producers' total cost of ownership (TCO) significantly.

### *BOPA: Various line types for outstanding high barrier films*

In China the demand for high quality food packaging made of BOPA film is constantly rising. At Chinaplas, Brückner Maschinenbau presents the latest concepts for simultaneous and sequential BOPA lines with a working width of 6.6 meters, increasing the output and the productivity by a good 30%.

### *Flexible & productive specialty film manufacturing*

- Optical film lines: Sequential and simultaneous technology for the efficient production of high value optical films;
- Multi-layer technology: Solutions for the production of complex 5, 7 or 9 layer ultra-high barrier films, based on a state-of-the-art multi-layer extrusion process;
- Battery separator film production lines: Brückner presents the best of both worlds:



Sophisticated and customized lines and components for the wet battery separator film production – for highest productivity and flexibility and Patented Evapore® line concept including full process know-how and film guarantees – for energy efficiency and low production costs.

### *Simplified operation with Intelligent Line Management*

Brückner's "Intelligent Line Management" is a completely new, integrated solution for an increased line availability, focusing on the process view as opposed to the usual machine view. This new operating concept is supported by several assistant systems which can also be upgraded with older lines.

► [www.brueckner.com](http://www.brueckner.com)

## ISO-13485 Certification in Singapore

■ Building on the international success of Medalist® medical thermoplastic elastomers (TPEs) produced in the USA, Teknor Apex Company has expanded its supply capabilities for these compounds in Asia by achieving ISO-13485 certification for its TPE production facility in Singapore.

ISO-13485 is an international standard for quality management in medical manufacturing. Teknor Apex previously achieved ISO-13485 certification for Medalist facilities in the USA and will now produce Medalist compounds in Singapore as well. The certification is accredited by Det Norske Veritas Certification, Inc. (DNV) and must be audited annually by the DNV to assess continuous improvement.

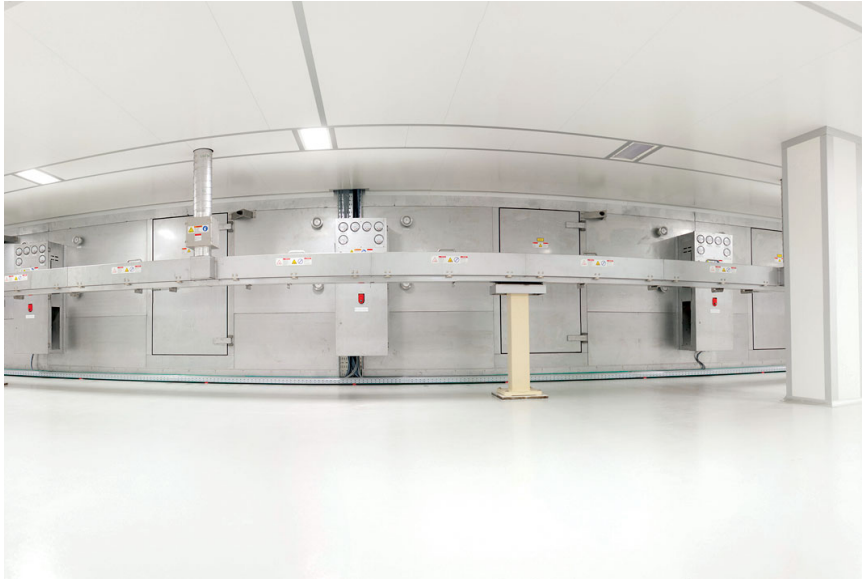
ISO-13485 specifies systems for consistent compliance with regulatory and customer requirements and includes provisions for risk management, sterile manufacturing,

and traceability. The comprehensive implementation program required for ISO-13485 certification requires focusing of the entire compounding operation on processes and procedures that maximize the safety and reliability of the compounds supplied to medical device manufacturers.

In addition to being produced in ISO-13485-certified facilities, Medalist medical elastomers are fully compliant with regulations for medical uses and meet stringent standards for biocompatibility and purity. All Medalist elastomers are made with FDA-compliant ingredients, are compliant with ISO 10993-5 and REACH SVHC, and are free of phthalates.

► [www.teknorapex.com](http://www.teknorapex.com)

## DORNIER: innovations for the production biaxial and mono-oriented films



DORNIER TDO in a clean room section

■ Lindauer DORNIER GmbH, the leading manufacturer of complete biaxial film stretching lines, is attending this year's Chinaplas, which will take place from May 16 to 19, 2017 in Guangzhou. At the DORNIER stand A27 in hall 5.1 customers receive news about the latest innovations for customized solutions for the production biaxial and mono-oriented films.

DORNIER with more than 50 years of experience offers a wide product portfolio of complete lines for PA, PS, TAC, PEN to PET and PP with widths up to 10.6 m, speeds up to 600 m/min and max. throughput of 10 t/h equipped with up to 7 layers extrusion or alternatively direct polycondensation plants in case of BOPET lines. DORNIER is well known for developing and producing highly reliable new equipment as well as upgrading existing customer lines worldwide. Engineering and production is truly made in Germany.

Customers from all over the world, especially from China, Japan, Korea, Indonesia, Malaysia, India, Thailand, Europe, United States, Brazil and Mexico trust in the performance and reliability of DORNIER film production lines supported by DORNIER service.

DORNIER is also one of the leading producers of weaving machines and systems for the composite fiber as well as for the glass and carbon fiber industry.

**Real flexibility in engineering is building extruders according to requirement.**



**CONEXTRU GmbH engineers extruders**

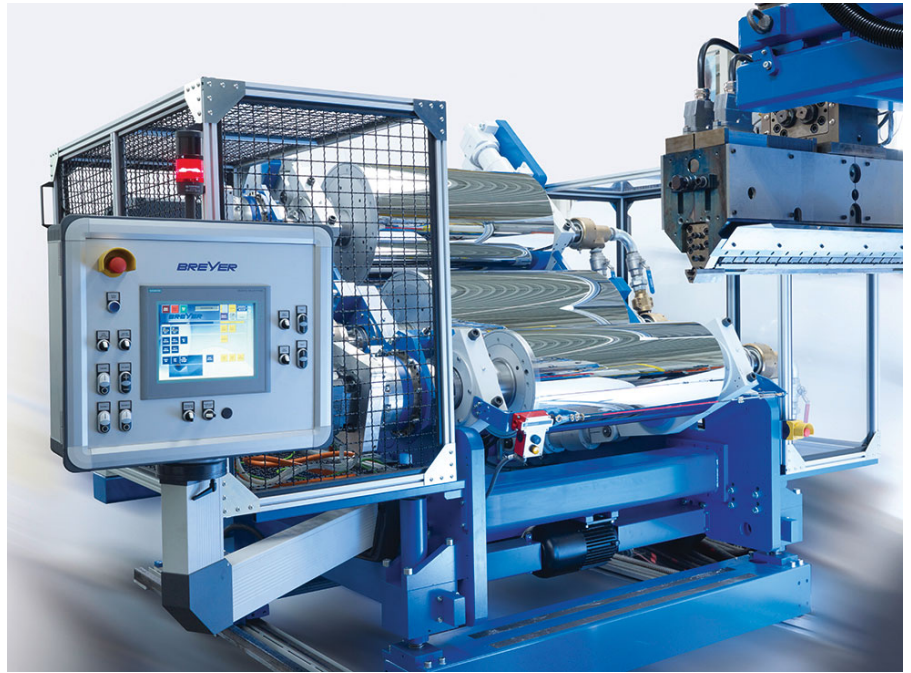
- in any shape
- for any polymer
- for high output or general purpose

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*The calender – the quality center of BREYER extrusion systems*

*BREYER GmbH offers their ThermoFlex extrusion line for the production of thermoforming film/sheet out of PET and PP,PS. The combination of experienced and simple line building-up with progressive technologies which save time and money makes it possible to produce flat film in an economic way.*



## Flat film line Breyer “ThermoFlex”

BREYER company in Singen, Germany has approx. 250 employees and has at its disposal a worldwide net of agencies as well as an own office for service and a sales department in Shanghai. Traditionally film, sheet and tube lines are belonging to our product portfolio as well as our tool manufacturing where film, sheet and ring dies are produced.

In the range of flat film lines BREYER has a considerable know how for the production of transparent flat film for optical applications. Also thermoforming lines belong to our product portfolio since the 1970's.

### Perfect flat film for successful thermoformed packaging

On the Breyer ThermoFlex system in co-extrusion version for 3-layered film, the fast startup of a PET film system and quick changeover to different film thicknesses is possible. Pure recycling material can be processed with a 120 mm single-screw extruder and a 60 mm coextruder.

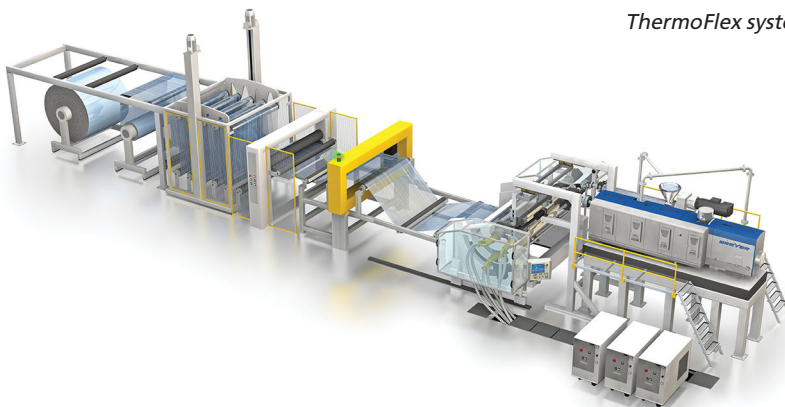
For the functional retrofitting of the system, Breyer offers a number of progressively conceived building blocks that save time, raw materials and, hence, money – all of the required preconditions for economically efficient film extrusion.

### Better quality and economical production

For the customer the BREYER concept ThermoFlex makes sense. They want to serve the market with first class film quality. They are confident that better technique will be honored at long term also in the packaging sector. Here the customer benefits from BREYER's long-term know how in the processing of transparent plastics to high quality semi-finished products.

The combination of experienced and simple line building-up with progressive technologies which save time and

*ThermoFlex system*







money makes it possible. Fast start-up due to the special melt pump control and quick adjustment of the film thickness with BREYER's calender technology "fast&easy" make extrusion economical. The staff benefits of an operator-controlled touchscreen and the BREYER fast&easy calendar gap setting where within seconds the needed gap can be reproduced. In addition this technique allows the production of low tension flat film which means a big advantage for the later thermoforming process.

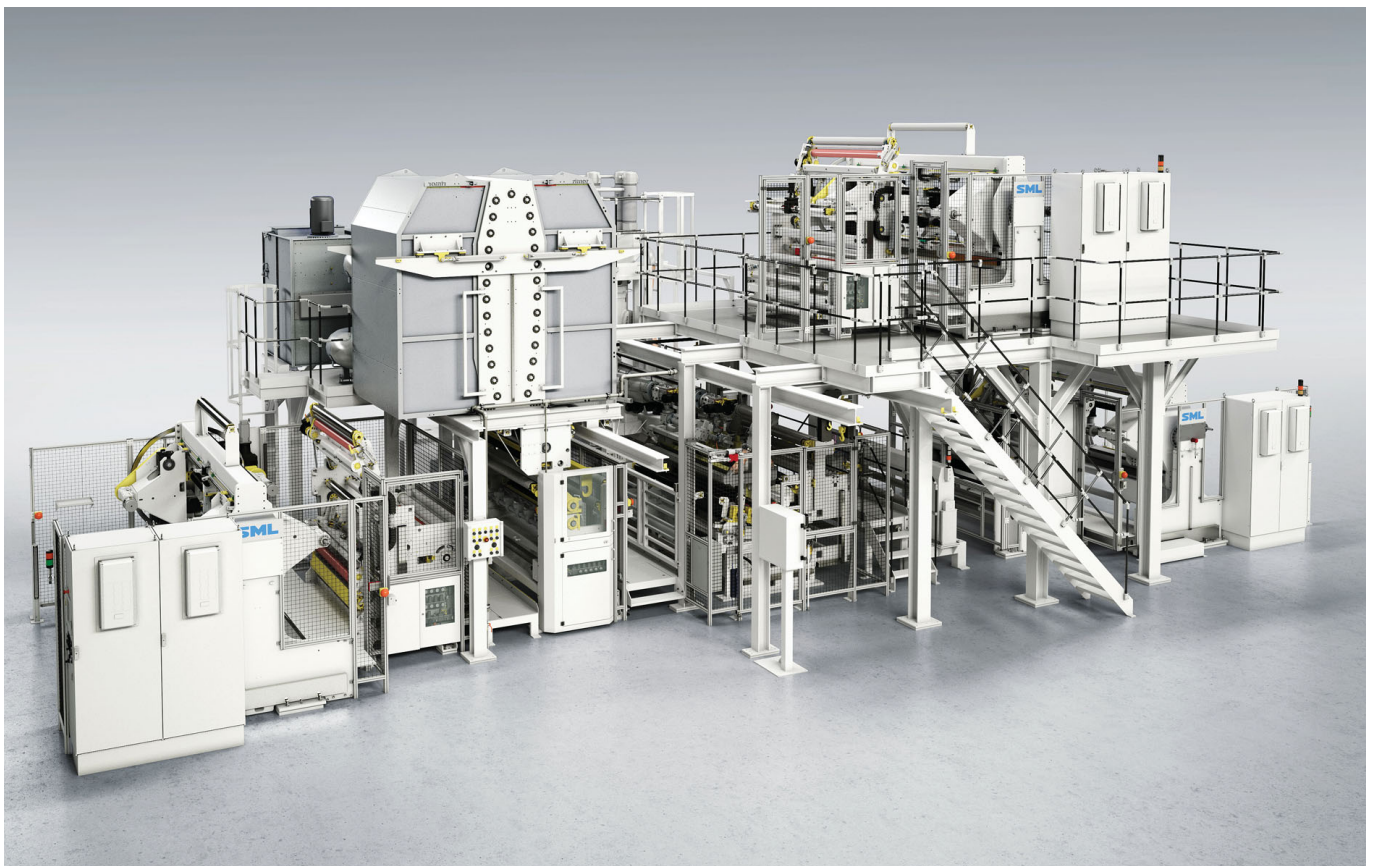
For fast processing of recycling material from thermoforming grids the IRD dryer is the right tool. It crystallite and dry the regrind material in one step. The line is very flexible and allows to produce different thickness of film resp sheet. The output of the line is 1000-1200 kg/h and it can produce multilayer film in the thickness range of 200 - 1000 µm.

[www.breyer-extr.com](http://www.breyer-extr.com),  
[www.breyer-thermoflex.com](http://www.breyer-thermoflex.com)



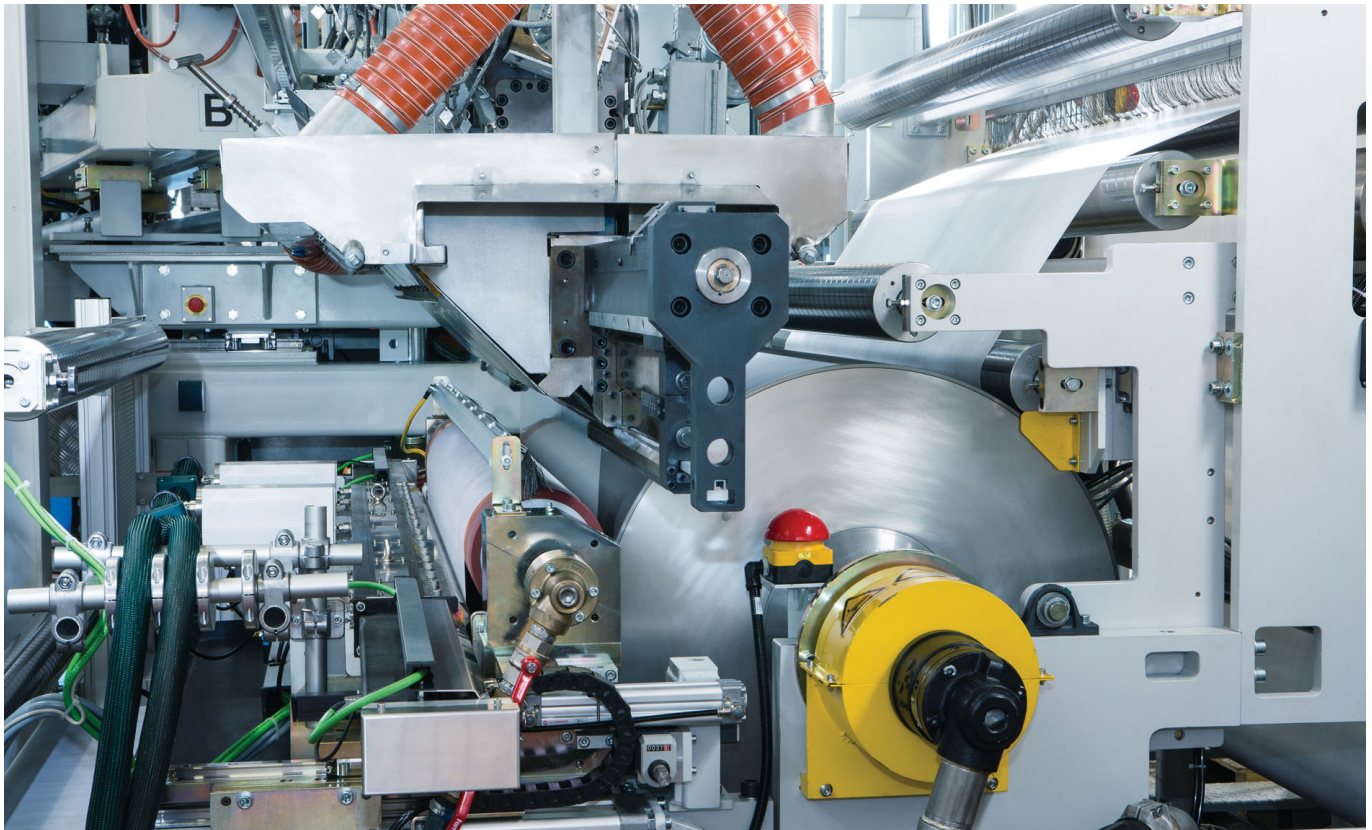
# FlexPack<sup>®</sup> coating line + DoubleCoat: new product diversity

SML at the ICE Europe 2017



*Flexible products constitute one of the fastest growing segments in the packaging industry and SML's commitment to this high-potential area is reflected by its innovative and skilfully engineered FlexPack<sup>®</sup> co-extrusion coating and laminating line.*





With its modular construction, the line can be designed according to specific customer needs and for the extrusion of various raw materials such as PP, LDPE, EVA, EAA, etc. Starting from a basic configuration for simple extrusion coating products, it is possible to equip FlexPack® with additional features that range from a primer coating station, tandem configuration and ozone treatment to supplementary unwinds, etc. This facilitates the manufacture of a variety of commercial packaging materials that includes highly complex laminate structures.

Compact design also guarantees excellent accessibility and simple operation, while shaftless unwinders

and re-winders allow splicing at full speed and easy reel handling. Moreover, despite the line's high-speed design, the utmost flexibility for product changeovers is guaranteed, which prevents waste and maintains productivity at the highest possible level.

On the bottom line, these advances add up to a wealth of product possibilities such as flexible packaging based on paper, film and aluminium foil substrates, as well as technical or medical applications.

*FlexPack® coating line + DoubleCoat = new product diversity*

In addition, the "DoubleCoat" process, for which a patent is pending, can be integrated into a standard

FlexPack® coating line to create fresh opportunities in the breathable product field. DoubleCoat combines extrusion coating with hot melt lamination and thus enables coating thickness minimisation, as well as product breathability enhancement. The DoubleCoat and FlexPack® combination is not only suited to the manufacture of soft touch hygiene products such as for femcare articles, but also medical products that include surgical drapes, which although highly breathable serve as an effective barrier against viruses and bacteria.

[www.sml.at](http://www.sml.at)



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*Optical system for inline monitoring of the film thickness and degree of crosslinking of organic coatings (© Photo Fraunhofer IVV)*

The Fraunhofer Institute for Process Engineering and Packaging IVV together with the Fraunhofer Institute for Applied Polymer Research IAP and the Fraunhofer Institute for Interfacial Engineering and Biotechnology IGB has been presented new developments in films and the efficient control of coating processes at the upcoming International Converting Exhibition Europe ICE was held in Munich from 21 - 23 March 2017. Under the motto "Functional films – efficient coating processes", emphasis has been put on new film functionalities and accelerated test methods.



# Functional films and efficient coating processes

## **Control and monitoring of coating processes inline – for the first time**

The development of a cost-effective, optical measuring system means that coating processes will in the future be able to be fully controlled and monitored over the entire substrate surface. The inaugural presentation of this new system developed by the Fraunhofer IAP and the Fraunhofer IVV would take place at ICE Europe 2017. The degree of crosslinking and thickness of organic coatings can be controlled inline via automated coupling of the measurement system to the coating unit. This prevents issues such as delamination, poor processing of web-shaped materials, and increased migration of non-crosslinked adhesive components.

## **Accelerated test methods for high-barrier films**

High-barrier laminates manufactured in roll-to-roll processes for the encapsulation of flexible solar cells and electronic components must have as low as possible oxygen and water vapor permeabilities. For quality assurance, it is a challenge to measure the permeability of such films over long periods of time. The tests can take several months. Now, however, the Fraunhofer IVV has developed a device for measuring the permeability of ultra barrier films in combination with associated computer software for simulating the permeation process. This enables the water vapor permeability to be determined 3 to 4 times faster than with conventional methods.

## **Further improvement of high barrier technology using atomic layer deposition**

The Fraunhofer IVV has acquired a new coating plant which utilizes atomic layer deposition to further reduce the permeability of films. Minimizing the permeability to water vapor and oxygen is the key to successful further improvement of high barrier films. Atomic layer deposition (ALD) is paving the way here. Coating via roll-to-roll processes allows high processing speeds and production efficiency to be achieved. Up until now, films with the highest barriers have been produced exclusively in vacuum processes. The new ALD plant at the Fraunhofer IVV enables the barrier properties of films to be significantly improved. This is a further step towards meeting the permeability requirements for OLED encapsulation in the medium term. The Fraunhofer IVV is using this technology for publicly funded R&D projects and to provide industry with customized solutions and research services for the development of processes and materials.

## **Anti-icing films reduce damage caused by ice**

The formation of ice on the rotor blades of wind turbines results in aerodynamic imbalance. In order to prevent damage, either the rotor blades must be heated or the wind turbine must be shut down. To tackle this issue, the Fraunhofer IGB has developed a number of anti-icing

coatings suitable for polymer surfaces. These water-repelling microstructured and nanostructured coatings ensure that any water remains a liquid, even at temperatures below zero, resulting in a 90% reduction in ice adhesion compared to uncoated surfaces. The trick: The surfaces provide the water molecules with no crystallization nuclei. Plasma technology is used to deposit the structured coatings onto plastic films made of impact-resistant polyurethane (PU). The coatings are not only of interest for wind turbines: these functional surfaces can also be applied to aircraft wings and solar panels. Furthermore, anti-icing coatings can also be directly applied to fabrics and plastics, for example for winter sports clothing, tents, and other outdoor articles.

*Fraunhofer scientists study how anti-icing coatings affect the freezing behavior of water droplets in an icing chamber*  
 (© Photo Fraunhofer IVV)



**Easy cleaning – printable films – water-repelling textiles**  
 Regardless of whether the requirement is for anti-fouling and easy-to-clean surfaces, printable films, or eco-friendly water-repelling textiles, the Fraunhofer IGB usually uses plasma processes to create these new surface properties. Plasma processes allow the top layers to be removed, so generating pristine surfaces and enabling chemical functionalities or other layers to be applied. Selection and control of the chemical processes enable the scientists at the Fraunhofer IGB to customize the surface energy and hence the wetting properties. This enables even textiles to be effectively equipped with water-repelling or oil-repelling properties – in an eco-friendly way without harmful byproducts or waste products.

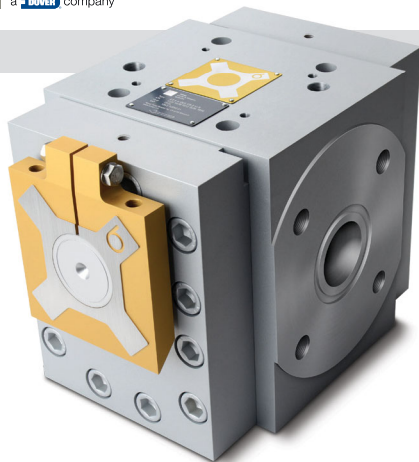
**“Intelligent” materials via roll-to-roll processes**  
 Whilst the properties of most synthetic materials are fixed, many biological systems have the ability to adapt to changing environmental conditions. Materials are, however, now being developed with properties which “change” on exposure to external stimuli. These so-called “intelligent” materials change, for example, when exposed to various physical and chemical stimuli such as temperature, light intensity, and pH or due to biomolecules such as proteins. This is being achieved using special polymers developed by the Fraunhofer IAP. This development work is being supported by surface technologies which allow even these intelligent materials to be manufactured on a large scale in roll-to-roll processes. In addition to classical methods such as corona and plasma treatment, printing methods (entire surface or structured) are widely used for the functionalization of surfaces.

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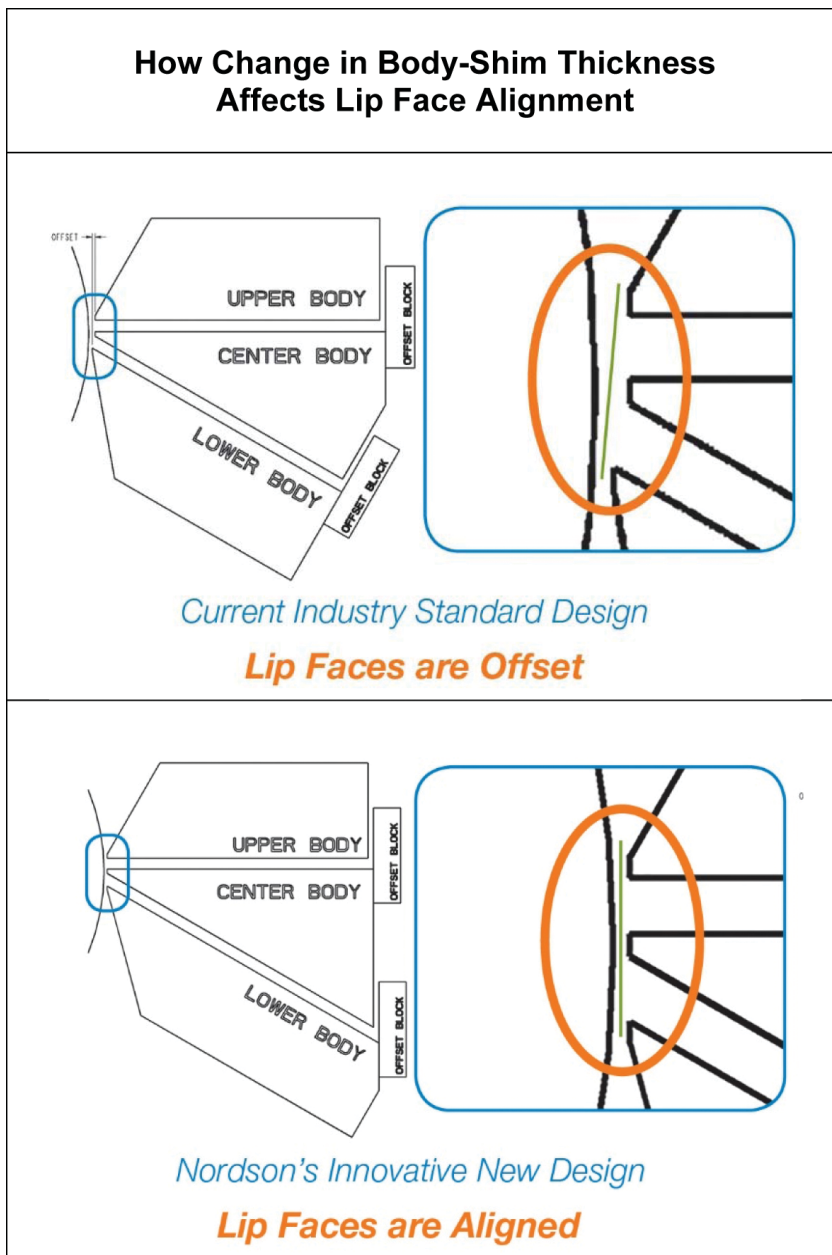
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# New die design for multi-layer fluid coating

Schematic shows how a change in body-shim thickness affects lip alignment in a standard fluid coating die (top) and in Nordson's new design

*A new, patent-pending design for dual- or multi-layer versions of Nordson Corporation's Premier™ and Ultracoat™ fluid coating dies makes it easier to achieve parallel alignment of the lip faces, which is critical for maintaining uniform, defect-free coating and preventing impingement of the lips against the roll.*



In the standard design for Premier fixed-lip and Ultracoat adjustable-lip slot dies, operators make changes to the die gap—and thus the wet film thickness of the coating—by inserting thin metal strips, or shims, between the die bodies, then using more shims at the rear of the die to eliminate the resulting offset of the lip faces and ensure that they are once again in the same plane. Until now, use of these “offset shims” has been more complicated in multi-layer dies, requiring calculations to determine which shim thickness most closely achieves lip face parallelism. The new design makes such calculation unnecessary, ensures a more precise lip face alignment, and prevents human error.

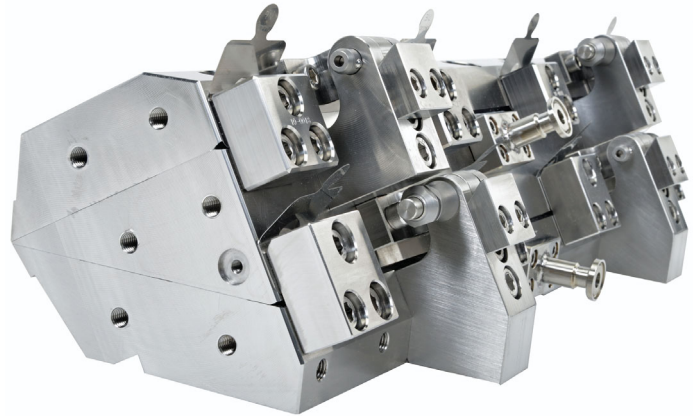
Nordson has achieved this improvement by reconfiguring the die bodies of multi-layer Premier and Ultracoat systems so that the offset blocks, where the offset



shims are inserted, are now in the same plane as the lip face (see schematic). As in the past, body shims and offset shims are available in thicknesses ranging up to 0.060 in. (-1.524 mm). With the new design, the accuracy of the offset adjustment is independent of body shim thickness.

“Nordson’s new design for multi-layer dies makes it easier for web converters to achieve the substantial cost savings and productivity benefits obtained by applying multiple fluids in a single pass,” said Keith Wheeler, business unit director for fluid coating systems. “Besides being more accurate and user-friendly, the new design for multi-layer dies eliminates the cause of lip misalignment and helps to prevent the costly damage to both die and roll that can result from simple human error in calculating the lip offset.”

Replacing multiple coating passes with a single product run means an increase in output and a reduction in machine use, energy consumption, and scrap. Additional cost savings result from control over the thickness of each layer, preventing over-use of expensive high-functionality fluids. At the same time, the converter has the flexibility of returning to single-layer production simply by closing the feed valve to the flow channel that is not in use.



*In this rear view of a dual-layer model of Nordson’s Premier™ fluid coating die, offset blocks, with offset shims protruding, are located across the width of the die. Visible on the side of the die are two flow channels that converge at the die lips*

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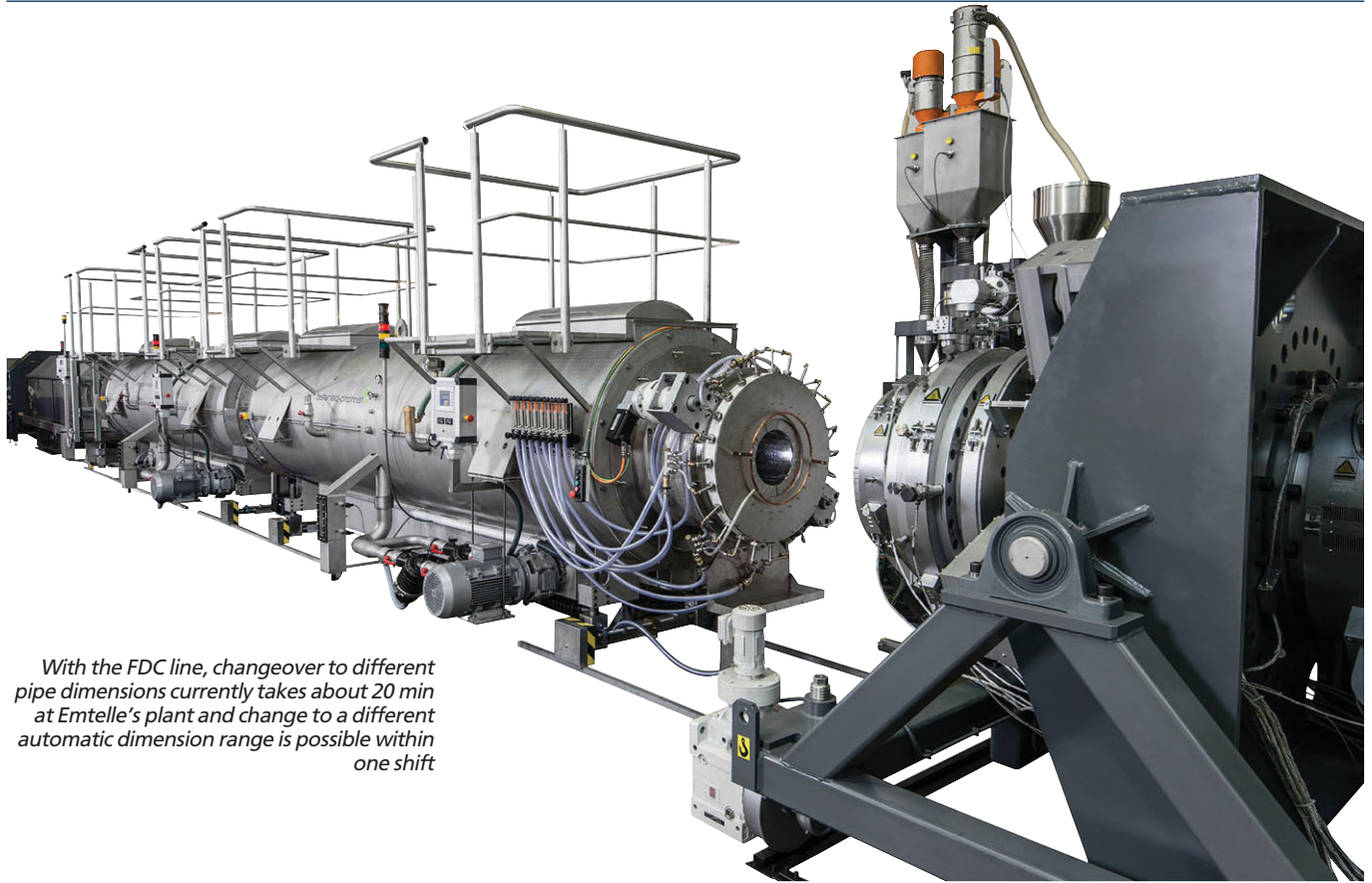
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*With the FDC line, changeover to different pipe dimensions currently takes about 20 min at Emtelle's plant and change to a different automatic dimension range is possible within one shift*

## FDC pipe extrusion line delivers ultimate flexibility in diameters and wall thicknesses

*"battenfeld-cincinnati was the only machine manufacturer able to meet our requirements in terms of full automation and ultimate flexibility", is how Kenn E. Byllemos, COO of Emtelle Denmark based in Sønder Felding, explains their decision to work with the German-Austrian extruder specialist. For about one year, the plastics processor has been operating a complete extrusion line from Bad Oeynhausen, Germany at its plant in Denmark, which produces 4-layer pipes with diameters ranging from 200 to 800 mm according to SDR classification (DIN 8074), as well as in special customized sizes - and all of this with minimal changeover times and scrap quantities. With its extremely flexible machine components, battenfeld-cincinnati optimally meets the market demand of its customers from the pipe industry.*

Emtelle ranks among the global players in the telecommunications industry. It produces pipeline communication network solutions worldwide, as well as micro and mini cables which can be blown in, thus combining under one roof the core competencies of developing and manufacturing plastic pipes with the production of blown-in fiberglass cables.

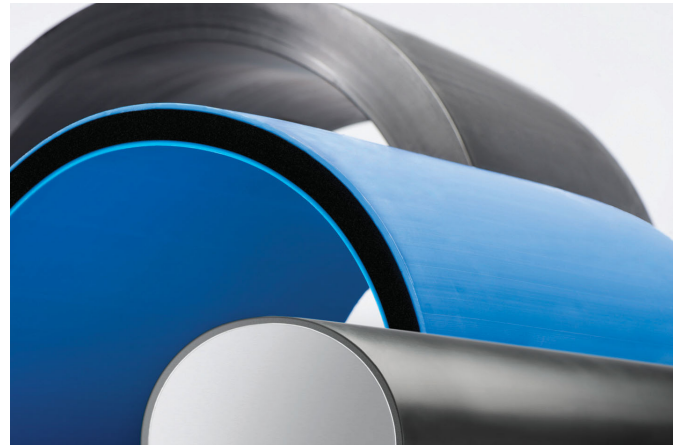
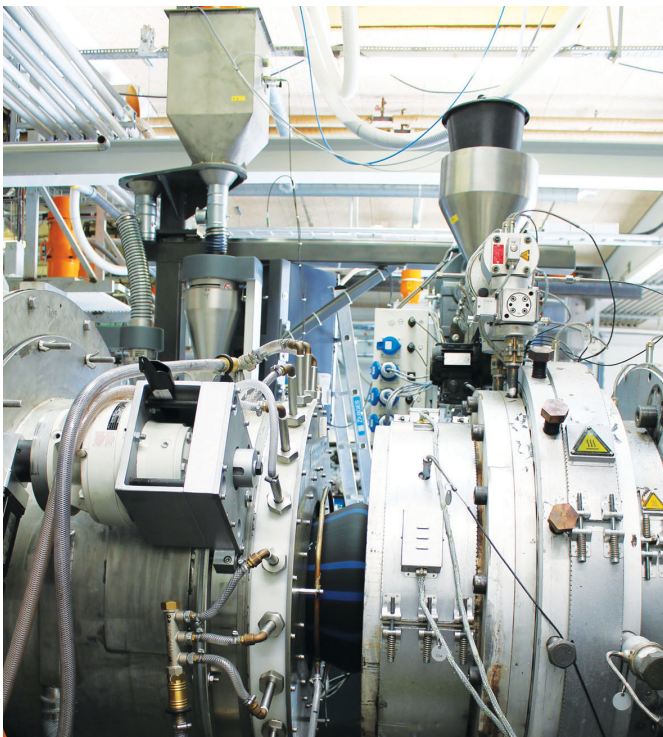
Emtelle continuously expands its product portfolio, for example at its Danish plant in Sønder Felding, where pressure pipes for water transport are currently also produced. To be able to fill all of its customers' orders promptly and without large inventory, the pipe manufacturer decided to purchase a complete FDC pipe extrusion line from battenfeld-cincinnati

to replace an existing, less flexible line. "The greatest advantage of the new line is its enormous flexibility", is how Kenn E. Byllemos expresses his satisfaction with the pipe extrusion line, which was installed about a year ago. This line is a 4-layer co-extrusion line with four extruders and a co-extruder for color stripes, which also includes two FDC calibration sleeves and a complete set of FDC downstream equipment. In this way, diameters ranging from 200 to 800 mm can be handled by a single line, which is unique in the industry. The smaller of the automatic calibration sleeves handles diameters from 200 to 355 mm, the larger diameters from 400 to 630 mm. Diameter ranges from 710 to 800 mm can be handled with standard calibration sleeves.

"In contrast to competitors' products, our calibration sleeves are made of a cylindrical, rolled metal sheet that comes close to a standard calibration in its design. The pipe dimension can be changed during production – seamlessly and fully automatically. Both standard and customized sizes can be produced with our calibration sleeves, not only in terms of external diameters but also in terms of wall thicknesses, which may vary for example between 6.3 and 57.2 mm", explains Brigitte Diekhaus, Project Leader at battenfeld-cincinnati.

"The fully automatic dimension change was a very important consideration for us, since we have more and more customers demanding customized sizes, for example cap pipes. These must combine a very small wall thickness with a relatively large external diameter", Byllemos adds. "In practice, changeover to different pipe dimensions takes us 20 min at most and changing to a different automatic range – e.g.

*Close-up view of pipe head and calibration sleeve at Emtelle's plant in Sønder Felding, Denmark during production*



*With the FDC line, pipe dimensions and wall thicknesses can be changed during running production*

from 200 – 355 mm to 400 – 630 mm can be effected within one shift. Another decisive advantage is that only very minor quantities of scrap are produced during dimension change", are further reasons given by Byllemos for his decision to choose the FDC system from battenfeld-cincinnati.

"For a color change during production, we have scrap quantities of less than 500 kg", Brigitte Diekhaus emphasizes. To achieve this, the line operates with an adjustable melt gap after to the pipe head, instead of a die-mandrel combination, which would have to be exchanged for a dimension change. For better results in color change, a radial distributor for the outer layer is integrated in the adjustable melt gap, so that the color change can be carried out quickly and with relatively little material for purging the outer layer channel.

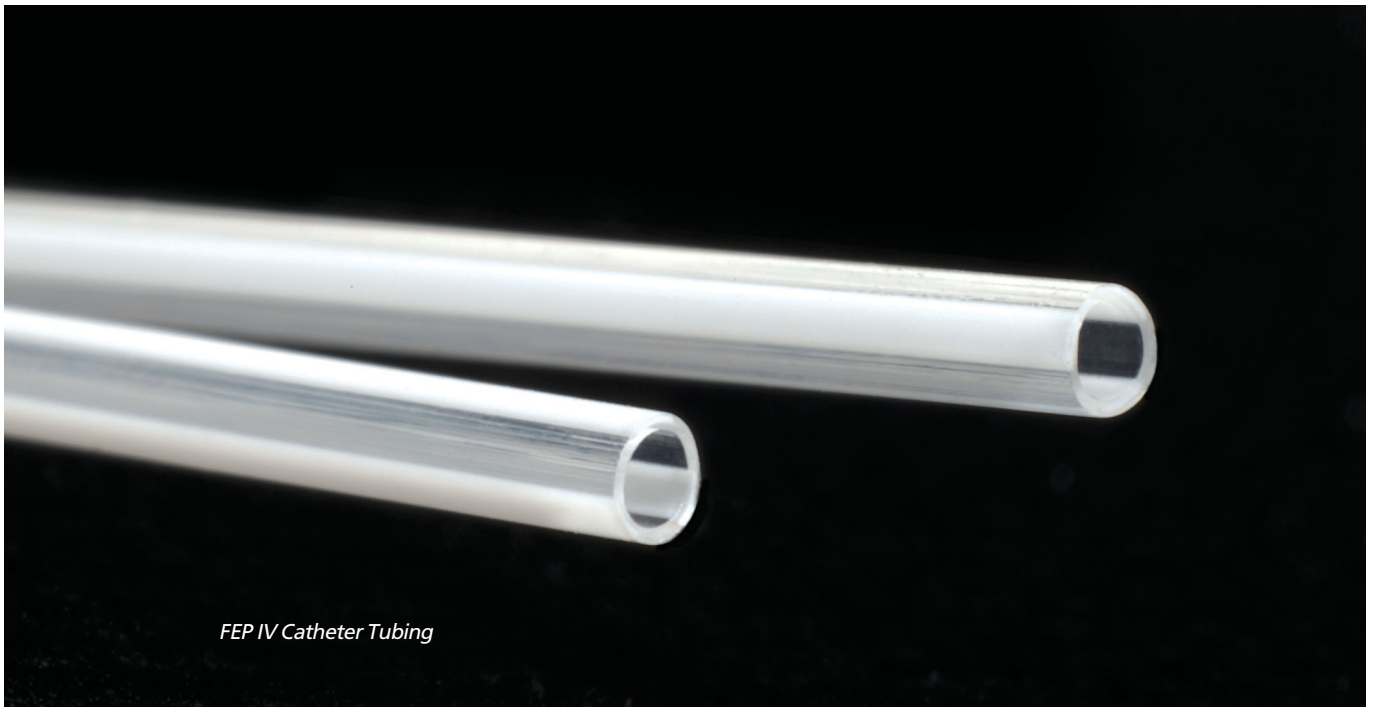
Automatic dimension change and consequently the high flexibility of the line as a whole is finally also ensured by the FDC downstream components, which are also a unique feature in the industry. The vacuum tank operates with a pipe support system covering 180° of the pipe's circumference and is steplessly adjustable over the entire dimensional range without modifications. This also applies to the haul-off and cutting device, which can be adjusted automatically during dimension change as well.

In close cooperation between the processor and the machine manufacturer, the haul-off has been designed to prevent deformation of customized pipes with small wall thicknesses. "The joint development work with battenfeld-cincinnati functioned perfectly, and we are very satisfied with the result", Kenn E. Byllemos praises the venture. To achieve the automatic changeover without any problems or human intervention, the battenfeld-cincinnati specialists have also extended the extruder control system in an optimal way, so that the changeover of all components can be effected at the push of a button. This type of fully automatic operation was also a decisive argument for Emtelle in favor of the line from battenfeld-cincinnati.

► [www.battenfeld-cincinnati.com](http://www.battenfeld-cincinnati.com),  
[www.emtelle.com](http://www.emtelle.com)



# Processing and Workplace Safety Tips for Fluoropolymer Medical Tubing



*FEP IV Catheter Tubing*

*Recently Graham Engineering Corporation has received a number of inquiries from medical tubing processors with an interest in venturing into the world of fluoropolymers. Materials such as FEP, PFA, PVDF and ETFE are known for their excellent physical properties and hold promise for many medical applications, such as micro tubing for intravenous (IV) catheters and insulin infusion, single lumen and multi-lumen tubing for endoscopy and cardiology devices, and heat shrink tubing used as a manufacturing aid for catheter reflow purposes. Our American Kuhne extrusion systems have been employed for such applications.*

Here are some important considerations that we have identified regarding extrusion equipment and safety related to processing fluoropolymers:

Components that come in contact with molten resin such as the die head, tooling, adapter, breaker plate, and screw should be made of corrosion-resistant metals with high nickel content like Inconel 625 or Hastelloy C276. For corrosion protection of the extruder barrel, I recommend a tungsten carbide/nickel-based bimetallic barrel liner such as X800®. For small medical extruders, 1.25-inch (32 mm) and smaller, the entire backing material of the bimetallic barrel is solid Inconel and the liner material is X800®. The typical fluoropolymer screw is a single-flight design with a 3:1 compression ratio. In some cases a low-shear Saxton-type distributive mixer is included at the end of the screw. Although Inconel and Hastelloy are corrosion resistant, these specialty metals have low torsional strength compared to common screws that are made of 4140 or 4340 heat-treated steel. For instance, Hastelloy 625 has a yield strength of approximately 52,000 psi (359 MPa), about half that of 4140 steel at 28-32 Rc. Inconel 625 is a little stronger than Hastelloy C276 but is not as corrosion resistant. Care must be taken to avoid screw breakage when using an Inconel or Hastelloy screw while processing other high temperature polymers that are not corrosive such as PEEK, Polysulfone (PSU), and Polyetherimide (PEI). For example, a 1-in. (25mm) extruder

Steve Maxson



Magnified View of Melt-Fractured Surface

with a 5HP motor geared for 100RPM screw speed is very likely to snap a screw made from Hastelloy 625 during a cold start situation.

Fluoropolymers have high melting points. For instance, PFA has a melting point at about 305°C (581°F). The barrel set points for FEP are in the 600-740°F range; therefore the extruder barrel heaters should be made from cast bronze and rated up to 480°C (900°F). Due to the high operating temperatures, a special dual-layer barrel safety shroud should be used over the barrel to protect the operator from burns.

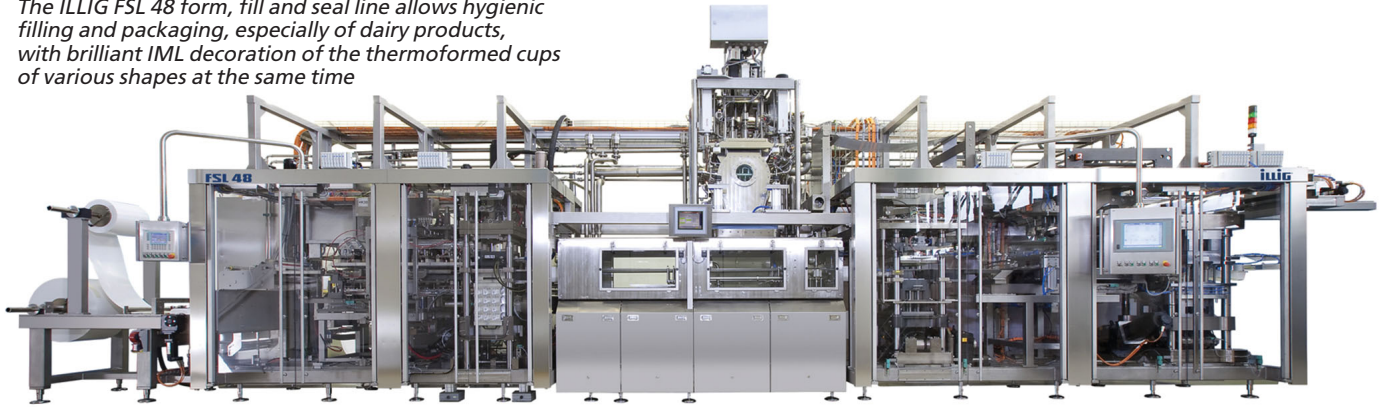
Fluoropolymers are also highly susceptible to melt fracture ("shark skin" appearance) on the surface of tubing, caused by excessive shear in the die tooling gaps as output rates are increased. The typical approach to avoiding melt fracture is to utilize larger tooling gaps, which means making the tubing with a larger drawdown. Tooling drawdowns of 3:1 to 20:1 are common for many polymers, whereas processors of fluoropolymers have used drawdowns of 50:1 or greater.

Proper safety measures are important to consider when processing fluoropolymers. According to the "Guide to the Safe Handling of Fluoropolymer Resins," published by the Fluoropolymers Division of the Plastics Industry Association (formerly SPI), gases, vapors and fumes released during the extrusion of fluoropolymers may be harmful to human health.

Vapors and fumes released during extrusion and while cleaning the die head can cause flu-like symptoms (chills, headaches, fever) that typically pass within 24 to 48 hours. The corrosive gases should be captured immediately and removed with an exhaust ventilation system that includes extraction hoods, ducting, and a fan. Extraction hoods should be placed above the die head and, for large-diameter tubing, an additional extraction hood over the area where the tubing is cut to length. Sealed packages of fluoropolymer resins should only be opened in well ventilated areas. Consult the resin supplier's MSDS for specific recommendations.

At our exhibit at MD&M West (Booth 1933), where we will have a compact modular American Kuhne extruder on display with two barrel modules including a high temperature corrosion resistant 1.0" barrel.

*The ILLIG FSL 48 form, fill and seal line allows hygienic filling and packaging, especially of dairy products, with brilliant IML decoration of the thermoformed cups of various shapes at the same time*



# Variable and attractive IML

*ILLIG; the systems provider for thermoforming solutions, will be showcasing state-of-the-art packaging systems at this year's Interpack, Düsseldorf, May 04 to 10. The machine manufacturer will present its new sector of packaging development as brand. The Heilbronn experts will demonstrate their expertise by the great potential provided by in-mold labeling in thermoforming (IML-T) combined with clean and hygienic filling and packaging of dairy products.*

## *Leading IML-T-technology – economic and decorative*

In live demonstrations ILLIG will show the production of rectangular cups out of PP on the IML-T production line IC-RDM 70K, forming area 680 mm x 300 mm, together with the compact IML unit RDML 70b. The 18-up mold produces cups with 3 different labels at the same time with an hourly output of 17,280 cups. Decoration is performed in brilliant photo quality on all four side walls of the pack and also on the bottom directly during forming. Currently, ILLIG is the only machine manufacturer from which IML-T can be obtained from one source with all required and optimally synchronized technology modules. IML-T lines integrated in form, fill and seal lines (FSL lines) are also realized for clean and hygienic production, especially in the dairy industry.

IML thermoforming developed by ILLIG is more favorable with regard to cost aspects than IML injection molding, for example, which is also used for decoration of plastic packs. The IML-T system allows flexible decoration of most cup shapes with labels. Moreover, investment amounts for molds and maintenance costs are cheaper than in injection molding. Thermoformed articles can be manufactured with thinner walls and they are thus more lightweight than injection molded part. Lower energy consumption during processing is a benefit in addition to the substantially lower material consumption. Economic benefits are provided by IML thermoforming, particularly because multi-cavity molds can be employed.

## *FSL 48 combined with IML-T: Variable dairy packs*

The FSL 48 form, fill and seal line developed by ILLIG is suitable for requirements by the food and especially the dairy industry. The filler with CIP (cleaning in place) and SIP (sterilization in place) functions

can be equipped technically in such a way that it meets the different hygienic demands by the food industry, even through to hygiene class IV according to VDMA (hygienic filling machines). All standard materials suitable for FFS lines can be processed on FSL 48, such as PS, PP, multilayer materials (e. g. PS/EVOH/PE), APET and even materials made of the biopolymer PLA (polylactic acid).

## *Packaging development by ILLIG*

Every pack is unique. From the customer's first idea through to an excellent pack which meets all recent requirements. There are numerous development stages in between and many technical questions that must be answered. ILLIG can meet these requirements thanks to its expertise in mold making and machine manufacturing and its knowledge of the markets – worldwide. The Heilbronn company with its new sector of packaging development can offer practical solutions and designs for thermoforming. ILLIG shows the great potential of thermoforming.

ILLIG is a leading global supplier of high-performance thermoforming machines and molds, as well as solutions for the packaging industry. The company's product and services portfolio includes the development, design, manufacture, installation and commissioning of complex production lines and components. With branches and sales agencies in over 80 countries, ILLIG is locally present in all markets around the globe. For nearly 70 years, the owner-operated enterprise has been serving its customers across the globe as a reliable partner for the cost-effective manufacturing of complex precision thermoplastic parts with innovative technology of unsurpassed quality and comprehensive worldwide after-sales support.

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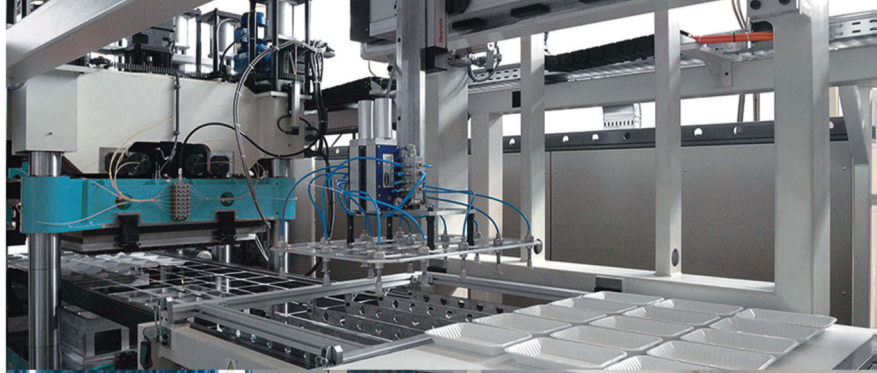


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