

03/2020

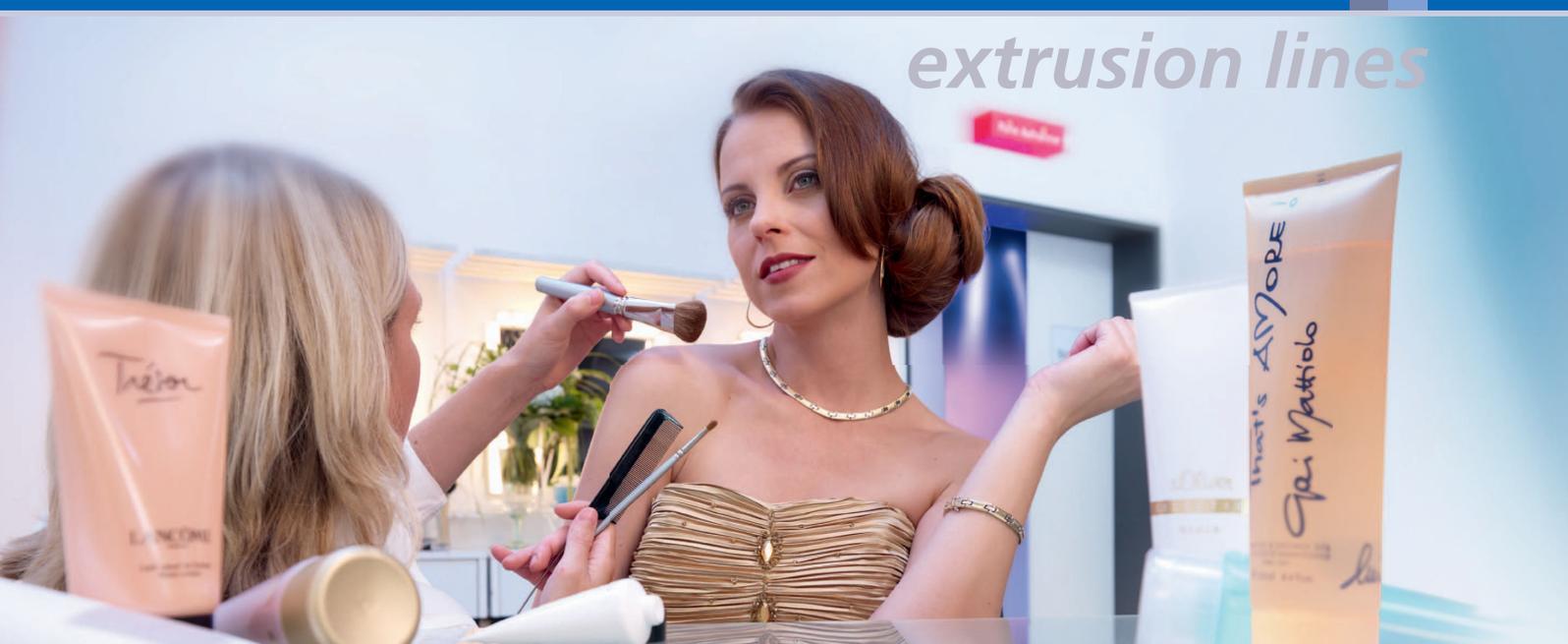
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# EXTRUSION INTERNATIONAL

## BREYER

*extrusion lines*

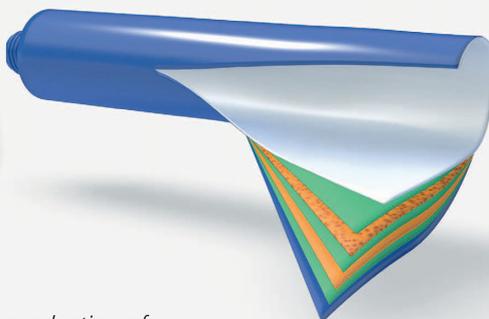


**Sustainable and flexible.  
High-performance tube extrusion.**

*TopLine*

**NEW**

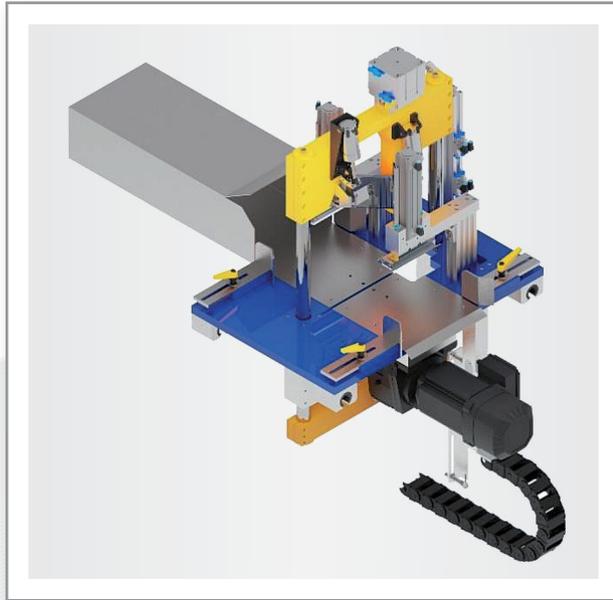
Up to 7 layers.  
Adapted for PCR post-consumer  
recycling material



**BREYER TopLine**  
Extrusion lines for the production of  
mono and multilayer tubes

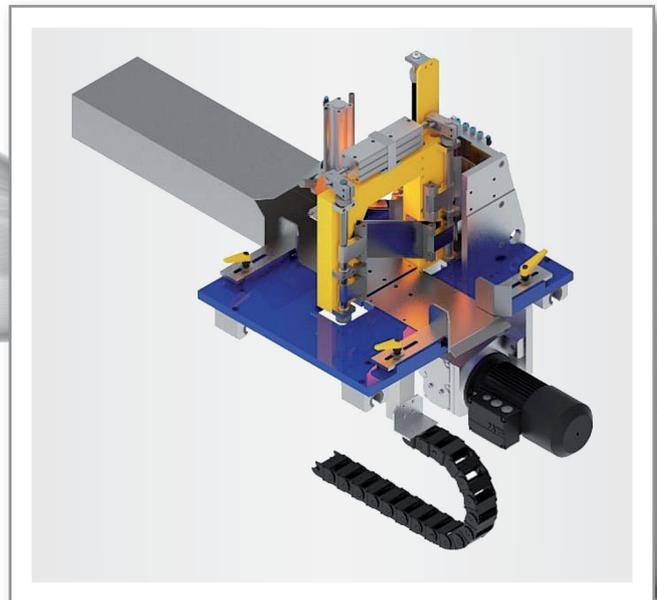
Quality made in Germany · [www.breyer-extr.com](http://www.breyer-extr.com)

## 20 Year Profile Guillotines made by Stein Maschinenbau - a continuously development



### PT1 Profile Guillotine

- solid design
- high cutting quality
- many hundreds times in operation



### PTW Profile Guillotine

- 2 cutting angles selectable
- optimum cut with different profile orientations

**NEW**



### PTT Profile Guillotine

- cutting angle continuously adjustable
- optimum cut for every profile shape

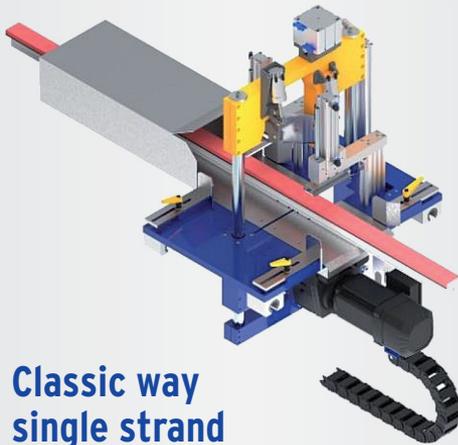
In addition to the guillotines shown, numerous customer-specific solutions have already been implemented.

**Challenge us!**

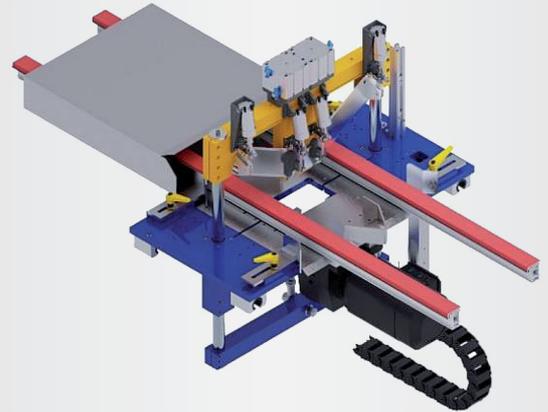


Made in  
Germany

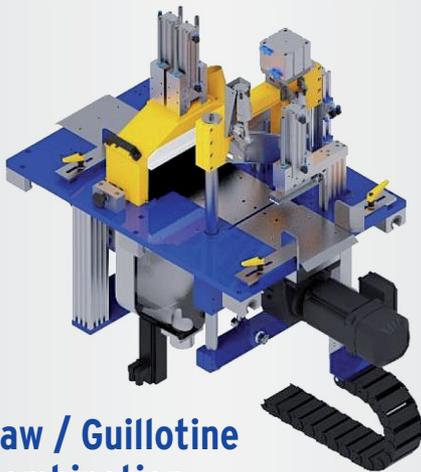
## Profile Guillotines made by Stein - fits to every system of profile extrusion



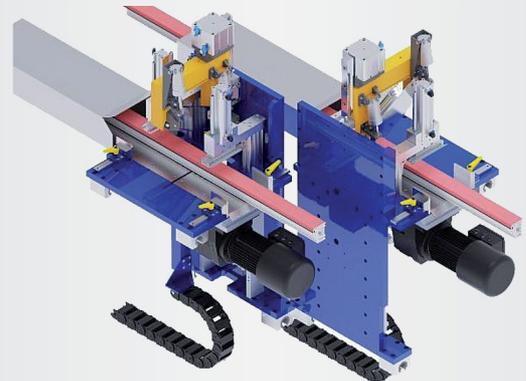
Classic way  
single strand



double strand or dual strand



Saw / Guillotine  
Combination



- Are different material or different profile designs made on same line?
- Saw / Guillotine Combination will cover it

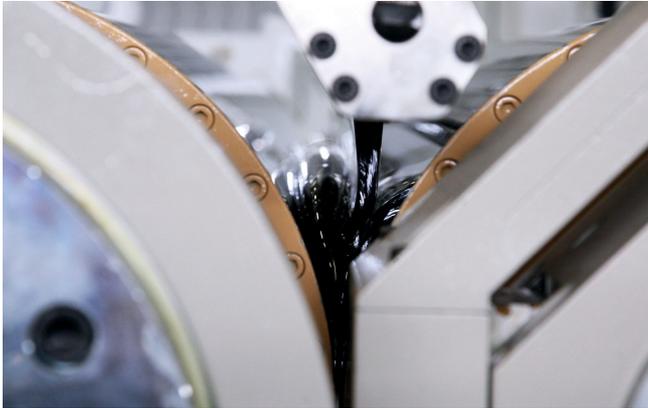
**Next step Smart Factory!**  
**Equip your line with machines**  
**made by Stein!**



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stein@stein-maschinenbau.de  
www.stein-maschinenbau.de

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**32** In times where our lives have changed, maybe forever, our business is going to change too. All of us are called to new challenges and to modify our business models to catch new business opportunity. The Italian company UNION Officine Meccaniche is ready for that.



Processing Technologies International, LLC (PTI) announced the recent sale of one of its Technology Development Center's (TDC) demonstration production sheet extrusion lines. **34**



**40** UK-based ACI® has announced the launch of an innovative new profile drying solution that is set to revolutionise the extrusion manufacturing industry.



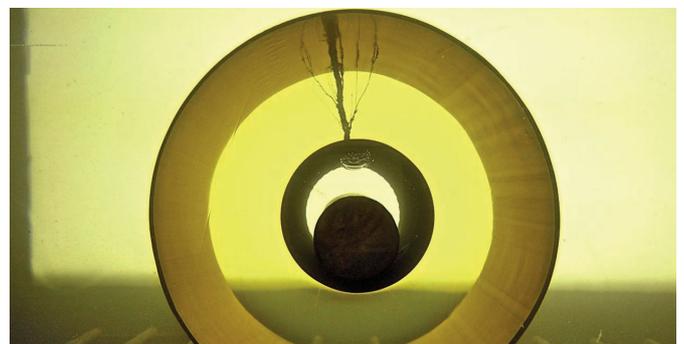
**41** Plastic recyclates often have off-odors, some of which have not hitherto been identified. The Fraunhofer Institute for Process Engineering and Packaging IVV (Germany) has analyzed the sensory properties of post-consumer shopping bags made of low density polyethylene (LDPE) and originating from different collection systems.

Kautex Maschinenbau's blow molding experts have successfully produced a large-volume polyamide liner for hydrogen pressure vessels using extrusion blow molding.



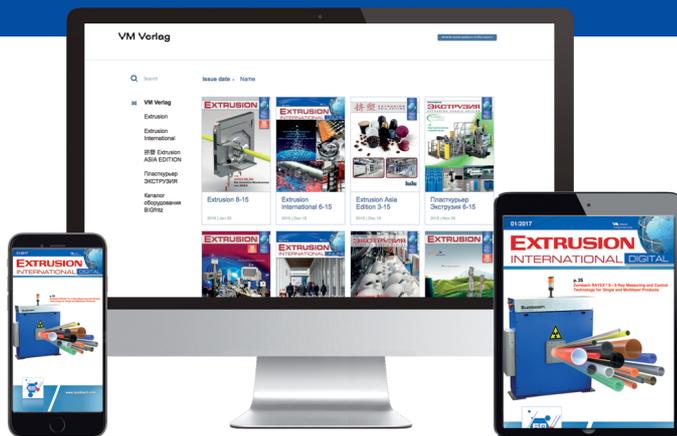
**42**

SIKORA AG has developed a special online inspection and sorting system that combines X-ray with optical technologies and, therefore, automatically detects and separates color deviations and metal inclusions down to a size of 50 µm. **48**



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**EDITORS**

Bettina Jopp-Witt (Editor-in-chief)  
Tel. +49 221 546 1539  
redaktion@vm-verlag.com

Dmitry Kosuch  
Tel. +7 996 730 0113  
d.kosuch@vm-verlag.com

**ADVERTISING SALES**

Martina Lerner  
Tel.+49 6226 971515  
lerner-media@t-online.de

Bella Eidlin  
Tel. +49 152 29907895  
b.eidlin@vm-verlag.com

Olga Kirchner  
Tel. +49 152 05626122  
o.kirchner@vm-verlag.com

**ADMINISTRATION**

Alla Kravets  
Tel. +49 2233 949 8793  
a.kravets@vm-verlag.com

**PRINTING**

maincontor GmbH  
Dr.-Gammert-Str. 13a, 63906 Erlenbach, Germany  
T.: +49 937294810811  
www.maincontor.de, info@frankhohmann.com

**SALES REPRESENTATIVES**

Quaini Pubblicita (Milano IT)  
Tel. +39 02 39216180  
info@quaini-pubblicita.it

China & Asia  
octavia@ringier.com.hk, Tel. +852-9648-2561  
maggieliu@ringiertrade.com, Tel. +86-13602785446

Tokyo PR Inc. (Japan)  
Tel. +81 (3) 3273-2731  
extrusion@tokyopr.co.jp

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#### 12th European Thermoforming Conference

30. 09. - 02. 10. 2020

Genf, Switzerland

[www.thermoforming-europe.org](http://www.thermoforming-europe.org)

#### PLASTPOL

06. - 09. 10. 2020

Kielce, Poland

[www.plastpol.com](http://www.plastpol.com)

#### Plastics Extrusion World Expo Europe

07. - 08. 10. 2020

Essen, Germany

<https://eu.extrusion-expo.com/>

#### 6th PLA World Congress

07. - 08. 10. 2020

Munich, Germany

[www.bioplasticsmagazine.com](http://www.bioplasticsmagazine.com)

#### 2020 PET Monomer Recycling Forum

07. 10. 2020

Brussels, Belgium

[www.eventbrite.com/e/2020-pet-monomer-recycling-forum-tickets-89570715421](http://www.eventbrite.com/e/2020-pet-monomer-recycling-forum-tickets-89570715421)

#### Fakuma 2020

13. - 17. 10. 2020

Friedrichshafen, Germany

[www.Fakuma-Messe.de](http://www.Fakuma-Messe.de)

#### Plastics Recycling Show Europe (PRSE)

27. - 28. 10. 2020

Amsterdam, The Netherlands

<https://prseventeurope.com/>

#### Plastimagen

10. - 13. 11. 2020

Mexico City, Mexico

[plastimagen.com.mx/2020/en](http://plastimagen.com.mx/2020/en)

## Fakuma 2020: Implementation of the Digital Transformation

■ Expert visitors will gain an overview of all modern plastics technologies from 13 to 17 October 2020 when roughly 2000 exhibitors present their companies in Friedrichshafen at the 27th Fakuma international trade fair for plastics processing. From injection moulding right on up to extrusion technology, thermoforming and 3D printing, expert visitors will be provided with current information on processes, technologies and tooling covering all aspects of plastics processing. As a working event for established practitioners, Fakuma is consistently aligned to the process sequence in the field of plastics processing. Exhibitors and expert visitors are able to discuss concrete projects directly with each other on an equal footing.

Fakuma will occupy all available hall space in the modern exhibition centre on Lake Constance. 1933 exhibitors from 40 countries and nearly 48,000 expert visitors from 126 nations came to Lake Constance in 2018. Trade fair promoters P. E. Schall GmbH & Co. KG have announced that the Fakuma will be even more international in 2020. All leading companies in the field of industrial plastics processing will meet here for an exchange of technical ideas and experience.

Digitalisation, connectivity, extended process integration and system solutions for equipment and peripherals have arrived at the plastics processing machines as well: to an ever greater extent, numerous options which up until recently were still in the planning stages, or only existed as visions or in theory with regard to the digital transformation, will be implemented and rendered tangible as factual reality at Fakuma 2020.

Fakuma's waste disposal concept is relentlessly evolving into the future as well. "We're constantly developing our waste disposal concept in order to achieve the highest possible recycling rate," says Gebhard Witt, head of Logistics & Service at Messe Friedrichshafen. At Fakuma, attention is focused above all on recycling the granulates and moulded parts produced at the event. "We were able to achieve a recycling quota of over 90% at the last Fakuma," according to Witt. Due to the fact that best possible pre-fractionation takes place on site when trade fair waste is collected, the requirements specified by the Recycling Management Act can be easily met. Messe Friedrichshafen examines sustainability potential on an ongoing basis too, for example by monitoring and controlling water and energy consumption.

Fakuma also deals with the issues of environmental protection, sustainability, efficient use of resources and circular economy. Climate concerns, difficult plastic waste situations and the negative image of plastics are promoting the need to implement economical and gentle production processes and to implement effective, broad-ranging recycling management. It will only be possible to master the plastic waste problem at the global level by means of higher recycling rates and improved efficiency in waste management. Factual clarification and a differentiated discussion with all parties involved in the value chain is necessary in this regard.



## Postponement and Venue Change of the 34th Chinaplas

■ On 6th April 2020, the State Council of China issued the circular of “The Further Control and Preventive Measures of the Novel Coronavirus at Key Venues, Units and Groups”. According to “Preventive Suggestions” in the circular, it has clearly mentioned that all kinds of exhibitions have to be stopped for the time being.

Under such circumstances, the 34th CHINAPLAS cannot be held as scheduled and will be further postponed from 3-6 August 2020 to 13-16 April 2021, and the show venue will be changed from National Exhibition and Convention Center in Shanghai to Shenzhen World Exhibition and Convention Center in Shenzhen.

As an important manufacturing and R&D center for innovative technology in China, Shenzhen has been chosen by the Chinese government as one of the driving engines in the future development of the Greater Bay Area. In shifting the 34th CHINAPLAS to Shenzhen, it will enable global plastics and rubber suppliers to tap into the emerging business opportunities in tandem with the further opening up of the China market.



► Adsale Exhibition Services Limited  
www.ChinaplasOnline.com

## OPC UA for Plastics and Rubber Machinery

■ In 2019, EUROMAP and the OPC Foundation have established the Joint Working Group “OPC UA Plastics and Rubber Machinery”. The aim of the international group is to develop worldwide standardized interfaces for plastics and rubber machines based on OPC UA. The existing EUROMAP recommendations EUROMAP 77 (data exchange between injection moulding machines and MES), 82.1 (temperature control devices) and 83 (general definitions) have now been published under the neutral umbrella of the OPC Foundation as OPC 40077, 40082-1 and 40083. The most important change is that the so-called namespace, which defines the globally unique identification of an interface standard, has been transferred from euromap.org to opcfoundation.

org. This paves the way for the adoption of the standard in other regions such as Asia and America. Even if the standard is translated into national adoptions and, if necessary, assigned a different local number, the uniform namespace ensures that the data to be exchanged is uniform and is recognized by the connected devices.

In addition, a new series for extrusion, OPC 40084, has been published. It considers the extrusion line as a whole with its production status and order management as well as the individual components with status and process values. Currently the different parts cover extruders, haul-offs, melt pumps, filters, dies, pelletizing, cutter, calibration and corrugators. Further parts for components such as calenders, splitting and winding will follow. The use of standardized digital data exchange facilitates the commissioning and operation of the extrusion line.

The published OPC UA specifications for plastics and rubber machines can be downloaded from the websites of the OPC Foundation, EUROMAP and VDMA:



► <https://opcfoundation.org/developer-tools/specifications-opc-ua-information-models/opc-ua-for-plastics-and-rubber-machinery/>  
 http://www.euromap.org/i40/euromap-interfaces/  
<https://opcua.vdma.org/companion-specifications>

## ICE Europe 2021: Converting Industry gets ready for 2021

■ From 9 to 11 March 2021, the international converting industry will gather at the Munich Trade Fair Centre in Germany for the 12th edition of ICE Europe, the leading sales and marketing platform for converting technologies in modern manufacturing. The previous show in 2019 saw a record number of 463 exhibitors from 25 countries, presenting their latest innovations in converting technology for paper, film, foil, nonwovens, and other web-based materials. With stand allocation now well under way, the new ICE Europe website offers plenty of information and easy online reservation for companies who plan to bring their latest converting solution to market. Demand for flexible packaging, special films and nonwoven products continues to rise in nearly every industry sector. From food packaging, industrial wraps, filter material and hygiene products to smart labels, high barrier films, optical foils, and high-tech fabrics: The production industry seeks to create new

products that meet specific performance attributes for specific end uses.

At the same time, public awareness of environmental issues has increased demand for eco-friendly products, making sustainability and efficiency a key driver in modern manufacturing. The food and retail sector in particular is looking for new packaging solutions that are either fully recyclable or contain recycled materials. And there is an ever-increasing need for creative and customisable options, and ongoing pressure to react quickly to market trends and demands.

Converting technologies play a key role to meet the sechanging needs and are constantly reshaping the way consumer products are packaged, marketed and used. At ICE Europe, exhibitors present the full spectrum of progressive converting solutions that help facilitate new surface treatments or mechanical processes to add functionality or enhance product features.

*The winners of the ICE Awards 2019 in the different categories*



### Popular ICE Awards for outstanding technological achievements

After the success of the ICE Awards in previous years, the most innovative exhibitors will again be honoured with the prestigious ICE Award for outstanding achievements and technological advancements in 2021. Each award category acknowledges and promotes the innovative spirit of exhibitors in relevant areas such as sustainability, digitalisation and efficiency.

► Mack Brooks Exhibitions  
[www.ice-x.com/europe/2021/](http://www.ice-x.com/europe/2021/)

## Interplas Postponed to 2021 with the Promise of "Bigger and Better"

■ Rapid News Group has announced the decision to postpone Interplas, the UK's flagship event for the plastics industry, to 2021. Originally scheduled for 29 September to 01 October 2020, the event will now take place from 29 June to 01 July 2021. The location of the event, at the NEC, Birmingham, UK, will not be affected by the change and the event will continue to take place in Halls 4 and 3A.

The decision to postpone the event comes as a result of the unprecedented times the plastics industry finds itself in as a result of the global Coronavirus pandemic.

Commenting, Duncan Wood, CEO of Rapid News Group, said: "We will continue in earnest with our preparations for the show to ensure it returns in 2021 bigger and better and with

renewed vigour as the market recovers from the challenges and difficulties presented by the current climate."

The UK's leading plastics trade associations have praised Rapid News Group's decision to postpone Interplas to 2021.

Visitors to the show in 2021 can look forward to a comprehensive conference programme delivered across three stages, each dedicated to enhancing a visit through the imparting of knowledge, insight and learning.

There will also be a host of interactive features, pavilions and networking events including a meetings programme and learning seminars.

► Interplas Events Ltd  
[www.interplasuk.com](http://www.interplasuk.com)

## Power to Spare

■ According to Frank Eisby, CEO of Vetaphone, the pioneers of surface treatment technology: "Production up-time is what we're all about – it defines our business and is part of our DNA."

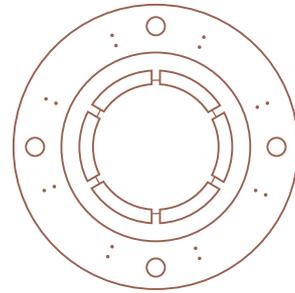
A bold statement some might think, but for the company that has more accumulated expertise on this subject than any other, it displays the confidence Eisby has in his firm's ability to meet any change in demand that the market throws up.

To highlight the company's lateral thinking approach, he cites a typical solution the company offers to customers who require high power Corona treatment. "If a customer's requirement is for 30kW we will offer to supply him with four modular-built 10kW units as an interlinked system. This system gives greater flexibility and has an automatic built-in reserve of power should a problem be incurred with any of the power units, or there is a future need for more than 30kW of power."

Another benefit is that it allows the user to operate the Corona system at less than maximum capacity full time, where electrical losses might be highest, and acts as a security buffer zone for critical situations, which Eisby compares with computer redundancy systems, or hospitals, where any downtime is costly and possibly life-threatening.

"You have only to calculate the enormous cost of a stoppage on one of today's high speed production lines to realise how important it is not to skimp on ancillary equipment," he said, adding, "It's the way in which manufacturing has evolved – and with our know-how as market leader we can help our customers stay ahead of their competition."

*Their modular design allows Vetaphone generators to be installed as an interlinked system to provide a power reserve*



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- conventional
- 2-point adjustment
- 1-point adjustment
- 4-point adjustment



## Dual Training to New Countries

■ Following on from Mexico and China, the global specialist for plastic packaging and recycling, the ALPLA Group, is now introducing dual training in additional countries: the first apprentices in India and Poland will be trained according to the Austrian model starting this autumn.

The global family-owned enterprise based in Austria is currently training 250 apprentices around the world, not only in Austria and Germany, where the dual training system taking place at a company and at school has a long tradition, but also in China and Mexico. India and Poland are now set to follow this year. The aim is to be one step ahead in covering the rising demand for skilled workers in these regions.

India's first Future Corner – the term ALPLA uses for its training workshops – is currently under development in the city of seven million, Hyderabad. The prospective machining technicians and mechatronics technicians will begin their training based on the Austrian model in the autumn. This opportunity will be given to up to ten young people a year. Two Indian instructors will be responsible for their practical training at the plant, while the theory side of things will be handled in cooperation with a local polytechnic.

Professional training will likewise get under way in Ostrów Mazowiecka north-east of Warsaw in the autumn. Six mechatronics technicians a year will be trained up in Poland.

### Recognised qualification

It takes a lot of preparation to introduce dual training in a new country. This includes talking to the local authorities, selecting the right school and settling on a curriculum. "The concept of dual training is only familiar to people in central Europe. But it is important to us that young people can earn themselves a qualification which is recognised in their coun-



*Nine apprentices in Toluca, Mexico, obtained the training qualification according to the Austrian model in February (Copyright: ALPLA)*

try," emphasises Fässler. At the end of the training, the apprentices take an exam in front of Austrian representatives. A certificate of equivalence can be applied for in Austria as the vocational and practical knowledge acquired is in line with the basics of the Austrian job profile.

Those who have graduated in Mexico and China over the years stand as a testament to the successful implementation of dual training abroad. Dual training began in Toluca, Mexico, in 2013. Upon completing their apprenticeships, the skilled workers work at the four plants in Mexico. Three apprenticeships are now offered in Mexico: mechatronics, machining and plastics moulding. A total of 16 new apprentices were welcomed last autumn – a new record. Nine apprentices successfully completed their training this February, bringing the total number of apprentices in Mexico with a training qualification to 45. Of these 45 graduates, 40 work at ALPLA.

■ ALPLA Werke Alwin Lehner GmbH & Co KG  
[www.alpla.com](http://www.alpla.com)

## POWTECH INDIA postponed to February 2021

■ POWTECH INDIA will be postponed due to current circumstances from its initial dates in September 2020 to February 2021. POWTECH INDIA will now take place parallel to HPCI India on 11 to 12 February 2021 in Mumbai. Companies can register for the trade fair with accompanying congress and supporting programme. Since 2010, NürnbergMesse India has been involved in organising events for the powder and bulk solids industries in India.



**POWTECH INDIA**

India's Leading Technology Expo for Processing, Analysis and Handling of Powder & Bulk Solids

POWTECH INDIA brings together India's experts from the production and processing technology environment. Decision-makers from the chemical, pharmaceutical and food production sectors, but also from the energy, recycling and non-metallic mineral (pit and quarry) industries, can find out all about the technologies that matter to them at the exhibition and accompanying congress. The wide range on display and the presence of international market leaders make POWTECH INDIA, which was previously known as Powder and Bulk Solids India, an important industry gathering.

■ NürnbergMesse GmbH  
[powtech-india.com](http://powtech-india.com)

## High-Performance Protective Material Certified

■ Walki's high-performance protective material for single use hospital aprons, Walki®Apron 45, has achieved the highest class according to the standard based on the DIN EN 14126: 2004 norm.

The material is now ready to be delivered to customers, who will make the aprons needed in hospitals all over the world in the fight against COVID-19.

The Walki®Apron 45 was certified to resist penetration by contaminated liquids under pressure and infective agents due to mechanical contact with substances containing contaminated liquids.

The material was also tested and certified for resistance to contaminated aerosols and solid particles.

"This means that the Walki®Apron 45 meets all the necessary safety standards, and the material is safe to use in protective gear for hospital personnel", says Bart Vansteenkiste, Business Development Manager Engineered Materials at Walki. The Walki®Apron 45 is based on a high-performance extrusion coated non-woven fabric suitable for medical applications.

The material used in hospital aprons needs to be highly tear-resistant to hinder the material from suffering damages during the manufacturing process. As hospital personnel work long days in difficult conditions, it is also important that the apron is comfortable to wear.

"The softness in the Walki®Apron makes it pleasant to wear", says Vansteenkiste.

The first batches have been delivered to customers already and the feedback from hospital staff has been very positive.



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## Metal Detector for Plastics Machinery – It has to be Simple

■ Plastics processors know-how important the utilization and uptime of expensive equipment such as injection moulding machines, extruders and blow moulding machines is for their business. Avoiding unscheduled downtimes caused, for example, by metal contaminants in the granulate is an absolute must. Therefore, metal detectors have become an important component in production lines of the plastics industry.

The white paper “Two important factors when buying a metal detector for plastics processing machines” from Sesotec is about answering two questions that are often not given enough attention when buying a metal detector, apart from detection accuracy and price:

1. How easy is it to install the metal detector in the production line?
2. How easy is the operation of the device for employees?

The white paper also contains a checklist to check whether a metal detector is both easy to install and easy to operate.

The white paper can be downloaded from the Sesotec website at



*In the white paper Sesotec provides answers to the requirements that should be met by installation- and user-friendly metal detectors (Photo: Sesotec GmbH)*

<https://www.sesotec.com/emea/en/resources/blog/important-factors-when-buying-a-metal-detector-for-plastics-processing-machines>

**Sesotec GmbH**  
[www.sesotec.com](http://www.sesotec.com)

## Technical Know-How for Quality Standards

■ In March 2020, the centre of competence for plastics recycling of environmental services provider Interseroh in Maribor, Slovenia, was awarded its official international accreditation. This means it is the only recognised research institution in the EU to have specialised on the development and analysis of recycled plastics. It is therefore setting the bar throughout Europe with the implementation of uniform standards of quality.

“When it comes to supplying industry with good quality recycled raw materials, this is an important step forwards,” explains Dr. Manica Ulcnik-Krump, Head of Business Unit Recycled-Resource at INTERSEROH Dienstleistungs GmbH. “The international accreditation according to laboratory

*Centre of competence for plastics recycling in Maribor (©ALBA Group)*



standard ISO/IEC 17025:2017 confirms the considerable technical know-how of our centre of competence, and creates transparency and confidence in the market.” The standard sets the general requirements regarding the competence, impartiality and operation of laboratories. In fulfilling the standard, they can demonstrate that they achieve valid results and ensure their international acceptance. The research centre in Maribor has fulfilled all the requirements of the Slovenian accreditation body Slovenska akreditacija (SA).

Interseroh has been operating the centre of competence for plastics recycling in Maribor, which has developed into a renowned research and innovation facility, since 2016. In 2017, the environmental services provider was awarded the Slovenian Environmental Prize for the development of its Recycled-Resource upcycling process.

Among others, the accreditation confirmed that Interseroh fulfils the international requirements regarding the mechanical and physical analyses of plastics. The standardised test procedures serve to improve the long-term stability of the mechanical and thermal characteristics of the material – and therefore its suitability for sophisticated applications.

**ALBA Group**  
[www.alba.info](http://www.alba.info)

## New Machines installed with WhatsApp Messaging Platform

■ Faced with new business challenges amid the COVID-19 pandemic, GN Thermoforming Equipment has come up with a novel way to install new equipment and train operators at its customers' sites. The company has made extensive utilization of the WhatsApp Messenger web platform to install new thermoforming machines for customers in Eastern Europe and the U.S. GN faced a critical challenge at the beginning of the pandemic when Georg Polymer, the largest Russian producer of rigid meat trays, needed its new GN760 machine installed quickly so it could meet the burgeoning demand for meat trays in Eastern Europe. "We had to think out-of-the-box and come up with a solution because our customer desperately needed the new capacity," said Paul Phillips, GN sales and marketing manager.

With the prospect of having to postpone the installation due to travel restrictions, one of GN's qualified technicians remotely guided its Russian customer through the installation of the new GN760, an in-mold cut thermoforming machine. The installation in April, which normally would take three to four days onsite, took about a week to complete using the WhatsApp platform.

The installation was successful thanks to the customer's broad mechanical experience with this type of machine and a high-speed internet connection. Perhaps the biggest challenge along the way was the language barrier. Georg Polymer faced some minor problems with wiring, but a video call to the technician resolved the issue. The machine is up and running, producing 240,000 meat trays a day. The company also has two other GN760s and three GN1914DM machines within its portfolio and produced more than 350 million meat trays last year.

Previously, GN had used its broad remote capabilities to perform various support tasks including troubleshooting. Phillips



noted that face-to-face machine installations are preferable so the company can personally provide its know-how and superior level of customer service and support. Remote installation through a messaging platform required a high level of preparation including enhanced labeling of componentry and extensive diagrams and collateral support.

Since April, two more machine installations have been successfully conducted using the WhatsApp platform - one in the Central U.S. and another for Pro-Form kft in Hungary. Both customers installed GN800s, adding to their existing GN machine lineup. If travel restrictions continue, Phillips said GN would continue to install remotely through the WhatsApp platform so its customers wouldn't face production delays.

GN Thermoforming Equipment  
[www.gncanada.com](http://www.gncanada.com)

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## New CEO

■ As of May 1, Wolfgang Steinwender took over as CEO of the successful Austrian plastics recycling machines manufacturer NGR. His predecessor Josef Hochreiter will devote more time to the further development of Next Generation Holding. Despite the worldwide uncertainties due to Covid 19, NGR is convinced it can continue the successful course supporting the plastics industry during its transition to the circular economy.

Since joining the company in 2014, Wolfgang Steinwender has been serving as Managing Director of the North American office in Atlanta, Georgia, where he headed the market penetration and customer support of the Americas.

Together with CTO Thomas Pichler and COO Gerold Barth, Wolfgang Steinwender will focus on the further development of the circular economy. NGR offers a full range of post-consumer, post-industrial and PET recycling equipment.

"About 400 million tons of plastics are being produced per year worldwide. It is key to put an emphasis on end-of-life plastics. Mechanical plastics recycling conserves resources protects the environment and improves the CO<sub>2</sub> balance. It is the key to sustainability. Therefore, it is crucial to achieve the highest possible quality of recycled materials by using innovative technologies and thus continuously increase the amount of recycled material in end products", says Wolfgang Steinwender.



Josef Hochreiter (left) with his successor Wolfgang Steinwender (right) (Photo: NGR)

Josef Hochreiter has managed NGR for 12 years and grew it into one of the leading companies in its industry. Since May, he focus on the further development of Next Generation Holding and, according to Josef Hochreiter, will continue to develop this global technology provider to support the transformation from a linear to a circular economy in plastics following the mission "Working for a better future".

■ Next Generation Recyclingmaschinen GmbH (NGR)  
www.ngr-world.com

## Single-Point Concentricity Extrusion Tooling

■ New crosshead from market leader features patented single-point concentricity adjustment. Guill Tool & Engineering introduces a new single-point concentricity extrusion crosshead that uses micro-fine adjustment screws for precise concentricity adjustment. The precision of concentricity reaches 0.008" or finer per revolution. This single point concentricity adjustment is a unique Guill innovation for the extrusion of thin-walled jacketing and precision ID/OD tubing. One adjustment bolt controls 360° of adjustment.



Features of the single-point crosshead include a patented cam-lock deflector for quick changeovers, with a residence time of one minute at .5 lb/hr material flow, optimized usage with extruders measuring 1/2" and 3/4", and a max die ID of .250."

Additionally, the Guill single-point crosshead offers great flexibility to its users. It not only accepts both vacuum and micro-air accessories, but is also ideal for pressure and sleeving applications. Fluoropolymer designs are available upon request. More information at:

■ Guill Tool & Engineering  
www.guill.com

## New Agent in Croatia

■ Macro Engineering and Technology Inc., a leading supplier of film and sheet extrusion systems, announced the signing of a representation agreement with KLIŠE-KOP, a well-respected Company in Croatia. "KLIŠE-KOP's impressive team will definitely bring new sales in a region where Macro has not been really present until now," said Martin Baron, Director of Sales.

KLIŠE-KOP have been in business over 36 years and enjoy an excellent reputation in the region, which in addition to Croatia it includes Austria, Slovenia, Bosnia and Herzegovina, Serbia, Montenegro, Kosovo and Northern Macedonia. Their list of principals includes companies like Soma, Focus, Celmacch, Orafol, Sandon, Tech Sleeves and XL Plastics.

Roman Šoić, Commercial Director, adds: "KLIŠE-KOP is pleased to have been appointed Macro's representative in our region. Macro's extrusion systems and services fill a void in our portfolio."

Both partners look forward to an excellent business relationship, and the strengthening of Macro's presence in the region.

■ Macro Engineering & Technology Inc.  
www.macroeng.com

## Powerful Vacuum Pumps for Mass Spectrometer Systems

■ Hena 50 and 70 are single-stage, oil-sealed rotary vane pumps which were specially developed for the demanding requirements of mass spectrometer systems. They achieve pumping speeds of between 32 and 59 m<sup>3</sup>/h, depending on their size and speed of rotation. Their integrated oil mist separator ensures clean exhaust air. They are equipped with a frequency converter that enables them to be used worldwide with single-phase input and identical pump capacity for 50 and 60 Hz.

A constantly high flow rate in the target pressure range, adjustable pumping speeds and low final vacuum contribute to the instrument's reliable high performance. Long maintenance intervals and operating hours are ensured by the high oil volume in the pumps and their low oil temperature during operation.

Hena 50 and 70 can increase the overall availability of the instrument through their high ruggedness and reliability. At the same time, they are easy to integrate due to their low noise level and efficient oil separation. Both Hena 50 and Hena 70 are certified according to UL and IEC 61010.



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[www.pfeiffer-vacuum.com](http://www.pfeiffer-vacuum.com)

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## New Member of the Executive Board

■ SIKORA AG has appointed Dr. Jörg Wissdorf as a new member of the executive board since March 1, 2020. He is familiarized for succeeding executive board, Harry Prunk, who will retire in a few months after 45 successful years with SIKORA.

"It was important for us to approach the succession at an early stage in order to ensure a smooth transition", says Prof. Dr. Thomas Sikora, chairman of the supervisory board



*New SIKORA AG  
executive board member:  
Dr. Jörg Wissdorf*

of SIKORA AG. He furthers: "We are delighted to have won our ideal candidate with Dr. Wissdorf". Jörg Wissdorf will be responsible for the areas Sales, Marketing and Service after a transition period together with the long-standing board member, Harry Prunk.

Before, the graduated aerospace engineer worked in several leading positions in Sales and Marketing as well as managing director of national and international companies. "I look forward to the new responsibility and want to further expand the growths of the company in the existing as well as in the younger markets," says Jörg Wissdorf. "To bring the specific advantages of SIKORA onto the markets in order to further increase the success of the company will be one of my core activities", explains Wissdorf.

■ SIKORA AG  
[www.sikora.net](http://www.sikora.net)

## Success in China with LFT Pultrusion Lines

■ Systems supplier ProTec Polymer Processing is enjoying ever greater success in Asia with its pultrusion lines for producing long fiber reinforced thermoplastic (LFT) compounds. Suzhou Sunway Polymer Co. Ltd. from the city of Suzhou in Jiangsu Province is one of the satisfied Chinese customers and is now producing pellets using its two ProTec LFT pultrusion lines.

In 2017, the compounder purchased its first 32 strand LFT pultrusion line from ProTec which has a pellet production capacity of 500 kg/h, while a second unit with 64 strands and twice the output followed in 2019. Over the last year, the company also ordered two SOMOS Gramix S9 gravimetric dosing and mixing systems which will be brought into service on the lines this year.

"Pultrusion", derived from "pull" and "extrusion", can be used to produce a wide range of fiber reinforced plastics. ProTec's pultrusion lines allow plastics manufacturers to automate the high-efficiency production of LFT pellets. The fiber-polymer combination can include virtually any common thermoplastic with reinforcement being provided as required by glass, steel, aramid or carbon fibers.

The new high-speed retrofit requires only slight modifications and additions to be made to existing pultrusion lines. Modifications include the addition of a preheater and optimization of die geometry. As a result, the fibers can be adjusted to temperature more quickly, so ensuring faultless impregnation at a distinctly higher production rate. A second water bath also increases cooling capacity. ProTec has like-



*Virtually any common thermoplastic can be used to produce LFT pellets with reinforcement being provided as required by glass, steel, aramid or carbon fibers (photo: ProTec Polymer Processing)*

wise modified the pelletizer. In the high-speed variant, specially arranged rotary knives chop the pellets at high speed to the optimum processing length of 6 to 12 mm.

■ ProTec Polymer Processing GmbH  
[www.sp-protec.com](http://www.sp-protec.com)

## Safe and Simple Power Clamp for Extrusion

■ A new extrusion clamp with electro-mechanical actuation is safer and simpler to operate than manual devices and provides more repeatable clamping forces.

The AutoGrip® power clamp from Graham Engineering's American Kuhne product line reduces downtime in installations with frequent screw, breaker plate, or tooling changes. It reduces the risk of injury or burns involved in manually releasing and tightening clamps during changeovers. The torque required in manual systems to sufficiently seal the clamp assembly is particularly dangerous with large extruder sizes. In addition, the manual clamps are typically heated to temperatures of greater than 400 °F (200 °C), increasing the risk of injury with traditional manual systems.

The AutoGrip clamp is remotely controlled by a two-hand pushbutton controller for user safety and convenience. The drive motor and gear box are mounted above the clamp, protecting them from melt residue and making them easy to access for maintenance.

"We have engineered the AutoGrip system with simplicity and safety in mind," said Michael Duff, Vice President of Sales and Service for Graham Engineering Corporation.

"While manual clamps are difficult to operate and inherently dangerous, this new automatic system from Graham Engineering speeds up changeovers and is easy to maintain."

The AutoGrip power clamp is available for extruder sizes of 3.5 in. (90 mm) through 6 in. (150 mm). In addition to applications involving new extruders, it can be retrofitted on many existing installations.



■ Graham Engineering  
www.grahamengineering.com

American Kuhne  
www.americankuhne.com

## New Agent in Indonesia

■ MAAG Group announced a distribution agreement with DKSH covering MAAG's top-grade equipment into Indonesia. DKSH Business Unit Technology, the leading Market Expansion Services provider for technology companies seeking to grow their business in Asia, has partnered with MAAG Group, part of the Dover Corporation. Prior to this recent partnership's extension, MAAG Group has had a partnership's footprint with DKSH in Japan, North Asia, back in 1990.

DKSH Indonesia will provide full services from marketing and sales, regulatory competence, distribution and logistics to after-sales services to bring the MAAG Group integrated system solutions for pump and filtration to across segment industries of polymer chemical, petrochemical, pharmaceutical and food industries.



■ MAAG Group  
www.maag.com

DKSH  
https://dksh.com/indonesia

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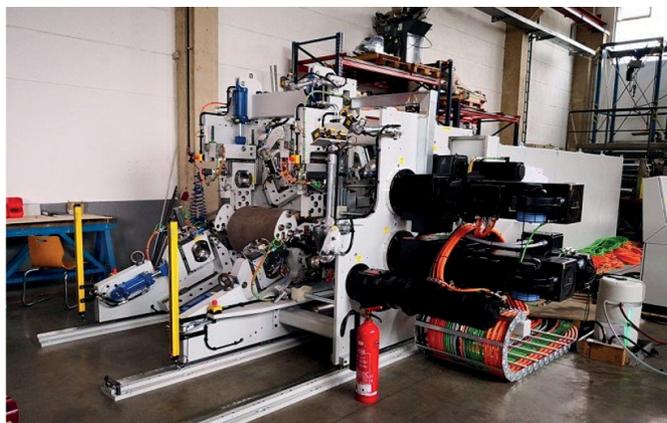
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USA  
sales@guill.com Attention: Bill Conley

## Calender Unit for Pressure Sensitive Adhesives customized

■ ER-WE-PA GmbH, Davis-Standard's German subsidiary, recently installed a custom five-roller calender unit for a global adhesive tape manufacturer. Designed to customer specifications at our recently ISO-9001-2015 certified ER-WE-PA facility in Erkrath, this machine features a unique design to accommodate layer thickness precision, reproducibility,

*Five-roller calender unit capable of supporting a variety of materials including foams, fabrics, PET or MOPP, or coated products*



processing flexibility and operator accessibility. ER-WE-PA is supporting converting customers by engineering innovative solutions for a wide range of applications, says Michael Krämer, Managing Director of ER-WE-PA. "Specifically for this customer, we took proven technology and customized various components to address sensitive adhesive processes. Even when subjected to significant shear forces, this machine is equipped to consistently control gap size within the micron range during production. The customer is very pleased with the performance in terms of increased capacity of current products and the potential for future growth."

The calender unit is capable of supporting a variety of materials including foams, fabrics, PET or MOPP, or coated products using five different application techniques. The calender rolls are individually adjustable in longitudinal and transverse directions, and the machine design enables a quick exchange of each pair of rolls. This makes it possible to process variable layer thicknesses with different viscosities. All essential machine functions and process parameters are automatically controlled.

■ ER-WE-PA GmbH  
<https://davis-standard.com/flex-packaging-films/>

## 3 Million Euros Donation for the 100 Year Anniversary

■ To mark its 100-year anniversary Huhtamäki is donating EUR 3 million to global sustainability initiatives with a local impact.

Acting today by using innovative and emerging technologies to clean plastic waste – Huhtamäki is donating EUR 0.6 million to clean plastic waste from Mithi river in Mumbai, India. The project is also raising awareness on effective waste management. The recipient is a partnership consisting of United Nations Technology Innovation Labs (UNTIL), VTT Technical Research Centre of Finland, a Finnish cleantech start-up RiverRecycle and an India-based citizen-led environmental movement Earth5R.

Educating for tomorrow by providing education and training on waste management in South Africa, Vietnam and India (WasteAid) – Huhtamäki is donating EUR 0.9 million to UK waste management charity WasteAid. The Huhtamäki funded project will provide education and training on waste management and circular systems in South Africa, Vietnam, and India. WasteAid is an independent UK charity, set up by waste management professionals to share waste management know-how with communities in low-income countries. Innovate for the future by investing in innovation for a circular economy through the set-up of a start-up cohort program

(Food System 6) – Huhtamäki is donating EUR 1 million to Food System 6, a non-profit accelerator focused on innovations for food and agriculture. The funds will be used to surface and support early stage solutions for a circular economy, via organizing a start-up cohort program.

In addition, Huhtamäki announced earlier a donation to the International Red Cross to boost COVID-19 emergency relief efforts in Asia and Europe and improving the lives of the world's most vulnerable.

"We want to make a difference, where it matters most. We made a first donation in support of the International Red Cross' work to alleviate the COVID-19 pandemic as a way to provide immediate help. The three other projects are in line with our ambitious sustainability strategy with the aim of creating a circular economy at different levels: acting today, educating for tomorrow and innovating for the future", says Charles Héaulmé, President and CEO of Huhtamäki. "With these donations we celebrate our centennial by giving back and investing in a sustainable future."

■ HUHTAMÄKI OYJ Global Communications  
[www.huhtamaki.com](http://www.huhtamaki.com)

# Co-Rotating Extruder for Advanced PP and HDPE Recycling



■ The Milanese manufacture – with more than 30 years of experience in the development of co-rotating extruders dedicated to advanced recycling – has successfully tested a new recycling line to be installed at a major Italian group active in the industrial components sector.

It is a second line selected by the customer following high satisfaction obtained from the installation of their first one two years ago, able to reach high production yields of compound regenerated from plastic waste (so called re-compound).

At the heart of the line is an ICMA high-torque co-rotating twin screw extruder characterized by two lateral feeders managing addition of various types of fillers and with special high vacuum pump units for enhanced volatiles extraction. The extruder maintains all the high-tech characteristics of the compounding sector. Interchangeable liners in the barrel with both faces perfectly machined for optimal interface

between cylinder and liners in order to grant a perfect temperature control of the melted plastics and the high-performance steels. All steel is sourced from primary blue chip suppliers and processed according to very strict manufacturing protocols.

The screw profile is optimized to process various families of polyolefin waste, following intensive software simulation, modelling and granulation tests in the new technology laboratory constructed recently with state-of-the-art compounding lines.

The high degree of flexibility in the ICMA extruder design combined with high-torque power allow processing various types of plastic waste into upcycling process able to deliver regenerated granule comparable to virgin resins. In addition, the simplicity of this line is a guarantee of valuable production versatility whilst maintaining the highest output yields, demonstrating further attractive benefits of ICMA's solution.

“The ICMA co-rotating extruder, specifically designed to process waste plastics, is an almost unique machine in the landscape of available solutions. ICMA has been a pioneer in the market of plastic recycling process technology, a fact that has allowed my company to accumulate over the years a deep experience in shaping the right process in line with customer's needs. In a very demanding market looking for no compromise over quality ICMA can make the difference,” said Giorgio Colombo, Owner of ICMA.

■ ICMA SAN GIORGIO – Industria Costruzioni Macchine ed Affini S.p.A.  
[www.icmasg.it](http://www.icmasg.it)



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www.kampf.de

## New 800 Series Hybrid Extrusion Tooling announced

■ Guill announces the introduction of a new version of its popular 800 series, known as 800 Series Hybrid. In some extrusion applications that utilize crossheads and inlines, layers of the exact same material are applied multiple times, using a single die. This method is used to reduce the propensity for errors caused by gels breaking through a thin wall, weld lines, inconsistent wall thickness, plus material and process variations. Additional errors include difficult-to-process materials and demanding applications where there is zero fault tolerance. Seeking to design the next generation multi-layer die to overcome these challenges, the engineers at Guill looked for a way to incorporate this technology into an updated version of the 800 Series. This led to the creation of the 800 Series Hybrid. The inherent benefits of the 800 Series are retained, including compact design, low residence time and a common deflector bore that eliminates tolerance stack up. The challenge was to create a hybrid design that incorporates the benefits of layer overlapping, while reducing unnecessary complexity and making the technology more cost-affordable for customers. This was achieved by overlapping layers in each semi-deflector, using a single cone. The highly efficient design of the 800 Series Hybrid reduces cost and size, as opposed to other methods of overlapping layers.

Essential benefits of the 800 Series Hybrid include eliminating weld lines in materials through patented overlapping technology, producing a more consistent finished product; reduced

sensitivity to changes in viscosity; reduced sensitivity to changes in line speed; myriad material and multi-layer application possibilities; works in all tubing and jacketing applications with a wide range of materials; low residence time; compact design and a low tolerance stack-up error factor, all resulting in improved concentricity.

The 800 Series Hybrid extrusion tool greatly reduces stagnation, because overlapping layers are more inherently balanced than single layers and also because each semi-deflector is "tuned to flush." Conventional deflectors must simultaneously achieve a balance between flushing, balancing and eliminating the weld line. There is less difference between the slowest moving material and the fastest moving material in the deflector channels, thus making the viscosity more consistent in the deflector.



■ Guill Tool & Engineering  
www.guill.com

## Eco-PET Reduces Plastics Consumption in Packaging

■ Packaging solutions made from Eco-PET are 20 to 30% lighter than conventional PET packaging. Depending on the application, they can be manufactured translucent or in any desirable color. The pearlescent effect gives the packaging a very elegant and high-quality look and feel. Thermoformed trays and cups made from Eco-PET feature excellent rigidity and are insensitive to scratch marks making them suitable to safely stow berries or other delicate foods. This helps not only to reduce food waste but also protects the environment, as each produced tray uses 20 % less plastic. It goes without saying that lower plastics consumption is significantly cutting manufacturing cost.

Eco-PET packaging can be produced from recycled bottle flakes and is fully recyclable after being used itself. It can be manufactured on any existing or new PET sheet extrusion line by incorporating Promix technology. By adding smallest amounts of environmental friendly gases, microcells are generated, resulting in a lighter product weight. Promix sup-



*Eco-PET tray produced with Promix technology: lighter weight and less plastic consumption (Picture: Promix Solutions AG)*

ports film and packaging producers worldwide throughout the whole process: from planning to implementation to commissioning.

■ Promix Solutions AG  
www.promix-solutions.com

## New ElectroStatic Separator

■ The launch of the new Bunting ElectroStatic Separator is in response to enhanced material separation requirements in the recycling, plastics and minerals industries. The ElectroStatic Separator uses tungsten electrode wire to generate electrostatic charges to separate dry liberated particles. The new technology significantly broadens separation capabilities, opening up new opportunities for recovering materials from waste and optimising mineral reserves.

Bunting is one of the world's leading designers and manufacturers of magnetic separators, metal detectors, magnets, magnetic assemblies and magnetising equipment. The Bunting European manufacturing facilities are in Redditch, just outside Birmingham, and Berkhamsted, both in the United Kingdom.

ElectroStatic Separation exploits the difference in electrical conductivity between various materials in a feed material to produce a separation. The separation depends on a number of key material characteristics including conductivity, moisture content and size range. In many applications, often due to the fine particle size, the ElectroStatic Separator is the only technology that enables a separation (e.g. -2 mm granulated cable scrap). The technology also replaces less environmentally friendly separation processes such as froth flotation in mineral processing applications (e.g. separation of rutile from silica sand).

*New ElectroStatic Separator*



*Inside the ElectroStatic Separator*



In operation, the technology utilises the difference in conductivity between insulators (e.g. plastics) and conductors (e.g. copper and aluminium) to obtain a separation on an earthed roll. A vibratory feeder evenly feeds a material mix onto the top of a rotating earthed metal roll. The rotating roll transfers the material under an electrode bar inducing an electrostatic charge. Non-conductive materials (i.e. insulators) adhere to the earthed roll via an image force, whilst the conductors lose their charge quickly and, under centrifugal force, are discharged. This enables a separation.

ElectroStatic Separators enable material segregation in plants processing minerals, producing plastics, and recycling secondary metals. Differences in conductivity found in recycled materials and minerals are sufficient to enable excellent levels of separation. Indeed, this includes the separation of metals with different conductivity. When recycling wires, the technology enables the separation of plastics (insulators) from conductors (Copper and Aluminium), followed by segregation of the two metals. The same principle is used to separate aluminium from plastic when recycling shredded window frames and electric waste (WEEE).

The mineral processing industry commonly uses ElectroStatic Separators in conjunction with high intensity magnetic separators such as the Rare Earth Roll Magnetic Separator and Induced Magnetic Roll Separator. This combined separation process is used when processing beach sands.

The Bunting ElectroStatic Separator is available as a single or double staged system in feed widths of 500 mm, 1000 mm and 1500 mm to suit a specific application.

The Bunting Centre of Excellence in the UK includes a laboratory-scale model of the new ElectroStatic Separator. Bunting invites companies to arrange for controlled tests to confirm the separation capabilities on a specific sample of material.

■ Bunting  
[www.buntingeurope.com](http://www.buntingeurope.com),  
[www.mastermagnets.com](http://www.mastermagnets.com)

## Focus on Circular Economy and Recycling

■ In its most recent meeting the Executive Board of IVK Europe (the European Association for Plastics Films and Sheets) confirmed its commitment to support the Circular Plastics Alliance (CPA) actions and to promote mechanical as well as chemical recycling on its markets.

The CPA is an initiative under the European Strategy for Plastics (2018) in particular under Annex III related to voluntary pledges by industry. The objective is to achieve a quantity of 10 million tonnes of recycled polymers to be reused annually by 2025.

The declaration was already signed in November 2019. IVK Europe shares the Alliance's vision and contributes actively to its operational work. On the basis of voluntary pledges, more recycled plastics shall be used in the upcoming years.

In order to meet the commitment new impulses shall be set by the IVK Europe project for mechanical recycling to separate coatings on the basis of polyester fibers and PVC. Another cornerstone in its strategy towards Circular Economy is the participation in the workshops of VinylPlus, the Sustainability Programme of the PVC industry, to define the goals of the next decade (2020 to 2030).

In its work, the association has been strengthened by the affiliation of three new members in the coated fabrics sector in the beginning of 2020.

■ IVK Europe:  
[www.ivk-europe.com](http://www.ivk-europe.com)

## Milestone for the Production of Biaxially Oriented PA Films

■ When the Chinese BOPA film pioneer and world's largest producer Xiamen Changsu makes an investment, the industry listens up – fully justified again. They just now ordered two new sequential film stretching lines from Brückner Maschinenbau which are the fastest, widest and most powerful of their kind so far: a working width of 7+m, a production speed of 340 m/min and an output of more than 2.5 tons per hour have not been achieved yet.

Wang Zhefu, Chairman of Xiamen Changsu says: „When we decided to make this investment, we had a clear goal in mind: lowest production costs with highest film quality at the same time. The new lines surpass our largest machines to date by 35% in speed and 50% in output. And based on our long-lasting experience with the Brückner technology we can safely assume outstanding film qualities with the finishing characteristics our customers expect.“

Phillip Chen, Managing Director Brueckner Far East is happy about the renewed collaboration: „Xiamen Changsu is one of our longest-standing customers in the BOPA business – not only in China, but worldwide. Since 2003 we have completed 10 joint BOPA projects successfully. They were characterized by great innovative spirit on the part of Xiamen Changsu, who, for example, were the first to use a twin-screw extrusion at BOPA or decided in favour of simultaneous systems with a working width of 6.6 m.

Reinhard Priller, Sales Director Brückner Maschinenbau, adds: „The new lines also mark the latest development stage in the field of sequential PA film stretching: From 4.2 to 5.1 to 6.6 m we now



*Successful BOPA film manufacturing at Xiamen Changsu with a simultaneous Brückner film production line*

reached a proud 7+ m. And Xiamen Changsu made all these steps along with us – a strong sign of true partnership!“

The lines are to start production in the last quarter 2021, right in time to produce film for the year's end business.

BOPA films have a variety of exceptional properties such as puncture, impact, burst and tear resistance. Tough packaging demands, outstanding gas barrier properties, a good resistance to oils, greases, solvents and alkalis as well as freezer-suitability are perfectly covered by BOPA films. They are therefore increasingly in demand for the packaging of fatty and oily food, distilled goods, agricultural or medical products. Brückner Maschinenbau offers a proven sequential as well as simultaneous BOPA technology.

■ Brückner Maschinenbau GmbH & Co. KG  
[www.brueckner.com](http://www.brueckner.com)

## Packaging Solutions Deliver Consistency and Quality

■ The protective properties of packaging used for medical, healthcare and food products have proven especially valuable during the COVID-19 pandemic. As converters have ramped up production, the necessity of quality processes and equipment to maintain packaging integrity while boosting outputs has been paramount. Davis-Standard's flexible packaging solutions are not only built for reliable outputs, quick changes and minimal waste, but are proven in terms of rigorous technical and business demands. Single-source responsibility from unwind to winder, an operator-friendly platform, and a global network have enabled Davis-Standard to help customers improve processes while offsetting costs in a high margin business.

*Davis-Standard's flexible packaging lines are engineered for reliable outputs, quick changes and minimal waste*



Advantages of Davis-Standard's flexible packaging solutions can be found in each line component. Unwinds are engineered with a high-speed splice for reduced waste, stub roll capability and to minimize tail length. Extruder packages offer gauge control and uniformity while allowing flexibility with extruder configuration and screw design. Coaters and laminators support seamless and expedient change-overs, excellent adhesion properties, as well as auto trim start for safety. Winders feature stationary knife transfer for high-speed transfers and reduced fold-over waste. Control systems reduce "dial-in" time and offer process monitoring and troubleshooting to assist with performance. Recipe storage, integrated control for third party equipment, custom drive control, pressure and gauging systems, trending and diagnostics analysis add to efficiency. All technology is backed by Davis-Standard's customer service is available 24 hours a day, seven days a week as well as vast global resources.

Davis-Standard is also available to support customers with R&D and new product development.

■ Davis-Standard, LLC  
[www.davis-standard.com](http://www.davis-standard.com)  
<https://davis-standard.com/flex-packaging-films>

## Innovation for Inspection Control – Intuitive, Browser-Based User Interface

■ Using inspection systems to monitor product quality early in the process ensures resource and cost efficiency in production. They supply system operators with information on process and product quality and highlight potential for optimization. ISRA's new browser-based graphical user interface (GUI) now makes it possible to control and monitor a large number of lines and the corresponding optical inspection systems installed in a production environment centrally and efficiently. With its high-end components, the proven SMASH inspection system from ISRA VISION can be quickly adapted to any customer requirement, be it velocity, width or other installation parameters.

Many manufacturers in the plastics industry face the challenge of monitoring a multitude of lines in their factories, each with its own separate inspection system. Traditionally, each system is equipped with a control cabinet and a control console, which are each controlled manually and individually – a process that requires a great deal of time and coordination. It revolutionizes day-to-day work by connecting all lines with a single server PC, making it possible to access the system as required from a central point, in real-time. All conventional end devices can be used for this, including laptops, smartphones, tablets, and desktop PCs. In a production hall in which 25 lines, for example, are equipped with inspection systems, the tool shows precisely which line is experiencing a problem. An operator can now find the exact position in a targeted manner and access the system and its line

*All input information  
with one customized  
individual view*



*Time saving by easy  
and intuitive setting of  
inspection recipes and  
parameters*



with their mobile device by using a QR code. Since dedicated line control cabinets and stations are no longer needed, the system saves space and costs.

As requirements grow, ISRA's inspection solution is increasingly developing into a real all-in-one system. Inspection is not restricted to material defects – ISRA now also reliably inspects the coating thickness and even the optical properties of films, such as reflectivity and cloudiness. The pioneering Touch & Inspect inspection and system architecture guarantees an ideal flow of information.

■ ISRA VISION AG  
[www.isravision.com](http://www.isravision.com)

## M·VERA® – Bioplastics for the European Market

■ Due to the current situation and in order to slow down the spread of the novel coronavirus, the demand for hygienic packaging materials is increasing. Plastics meet the requirements such as good barrier properties and are thus often used. However, the possibly increasing amount of plastic waste poses a problem. BIO-FED meets these market needs and provides customised solutions for high bio content materials.

BIO-FED produces and markets biodegradable and/or biobased compounds under the M·VERA® brand. As a branch of AKRO-PLASTIC GmbH BIO-FED is part of the international Feddersen Group which has its head office in Hamburg/Germany.

The M·VERA® portfolio includes film extrusion materials with good transparency as well as a variable bio content. All film

materials are approved for food contact and most of them are certified according to EN 13432. Also, for the French market requirements BIO-FED is able to serve customer needs to fulfil the standard NF T51-801 (11-2015) and a bio content (14C = Carbon from renewable sources) of more than 50% according to ISO 16620. Beyond applications for food packaging M·VERA® can also be used for mulch films, etc.

BIO-FED supplies M·VERA® injection moulding materials which are certified according to OK compost HOME and OK biodegradable SOIL by TÜV AUSTRIA Belgium.

Moreover, the R&D department of BIO-FED is always working on new biocompounds to fulfil further regulatory requirements and customer needs.

All M·VERA® materials can be colored individually – for example with the AF-Eco® biopolymer based masterbatches which are certified in accordance with EN 13432. The AF-Eco® range consists of color and carbon black masterbatches as well as additive masterbatches.

■ BIO-FED  
Branch of AKRO-PLASTIC GmbH  
[www.bio-fed.com](http://www.bio-fed.com)

*Biodegradable plastics protect the environment*



## PVC Products Provide Vital Help

■ For more than 60 years vinyl products have been successfully used in the healthcare sector and are indispensable to protect life. This is also evident in view of the current corona pandemic and is demonstrated by the wide range of medical applications, such as pharmaceutical blister trays for medicines, infusion tubes, blood bags, respiratory masks and tubing, tubing for extracorporeal membrane oxygenation of blood (ECMO), disposable protective gloves or other components of medical equipment.

The range of high-performance PVC products in the healthcare sector is wide and is constantly being expanded with new applications. About 40 percent of all medical plastic products in European hospitals are made of PVC. They improve the chances of recovery, extend life expectancy and enable the best standards of hygiene. PVC has achieved its widespread use in the healthcare sector not only because of its individually adaptable material properties, but also because of its attractive designs and low purchase and maintenance costs in times of tight budgets. Core applications include flexible bag systems, for example. These include blood bags that can be easily sterilized and frozen. These soft foil bags extend the shelf life of blood up to 42 days and protect the red blood cells from hemolysis. Vinyl is also often the first choice for tubing systems for artificial ventilation, infusions, transfusions or flushing and suction processes via catheters, thanks to its good usage properties. The material proves to be very

resistant to kinking and can withstand high mechanical stress without damage. Oxygen and anesthetic masks ensure survival in extreme situations. Thanks to the use of tiny tubes and moulded parts that offer impressive functionality in a minimum of space, minimal invasive surgery can now be performed. This protects the patient, reduces the risk and enables a much faster recovery than after major surgeries.

PVC products also have a firm place in building and construction applications in the healthcare sector. In addition to energy-saving PVC windows and solid, durable pipes, insulated cables and roofing membranes are used in many places. Stretched ceilings enable quick ceiling renovation without long downtimes and have a positive effect on room acoustics. Washable wallpaper and PVC profiles protect hospital corridors and patient rooms from dirt and damage caused by beds and handcarts. PVC sheets are installed as wall coverings because of their good hygienic properties and easy cleaning, but they are also convincing because they are impact-resistant, liquid-tight and quick to install.

Intensive care units, operating theatres and patient rooms are increasingly being fitted with vinyl floor coverings, which are proving to be extremely hard-wearing, stain-resistant and durable under the extreme stresses of daily use. They are also often used as orientation aids or for color-coded area marking in clinics. A significant advantage in terms of good hospital hygiene is the easy cleaning of the smooth surfaces. In addition to the facilitated control of spread germs and bacteria, this helps to increase patient safety and also reduces the maintenance costs, which can account for up to 92 percent of the total life cycle costs of the coverings: the right answer to the continuously increasing cost pressure in the health care sector without neglecting comprehensive hygiene. Thanks to their good sound absorption and anti-slip properties, the floorings also improve the working conditions of doctors and nursing staff who spend many hours a day in operating theatres or have to walk longer distances in hospitals. At the same time, they offer many modern designs that turn doctors' surgeries as well as patient rooms and canteens into feel-good rooms.

In order to support the circular economy and conserve valuable resources, various recycling systems for PVC applications in the healthcare sector are already available in Europe for years. In this way, the industry is making an important contribution to sustainable development.

*Author: Michael Friedrichs*

*(Photo: AGPU/istockphoto/JarekJoepera)*



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OF THE CIRCULAR  
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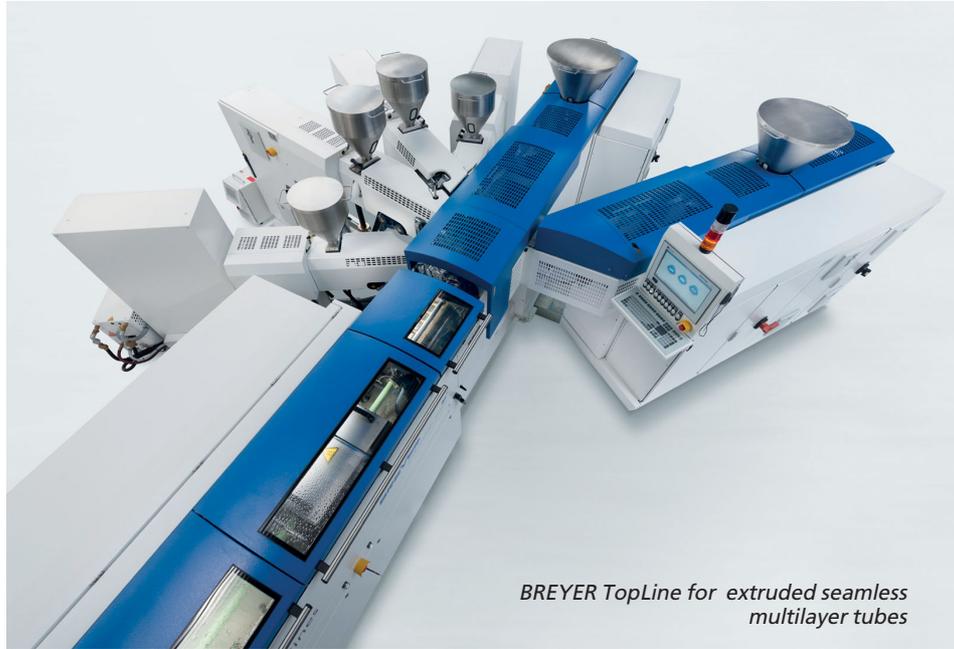


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*Responsible Handling of Our Resources. BREYER presents the most versatile and varied tube extrusion ever*



*BREYER TopLine for extruded seamless multilayer tubes*

## 2020 Novelty – Sustainable Tube Extrusion for Cosmetic Applications

The requirements on packaging for cosmetic tubes is changing. Sustainability is the key word which drives the market. Sustainability can be achieved by adapting a lot of different parameters: Reducing the amount of raw material, using environmental friendly recycled or bio-based raw material and closing the loop by making the packaging recyclable are the key demands on packaging side.

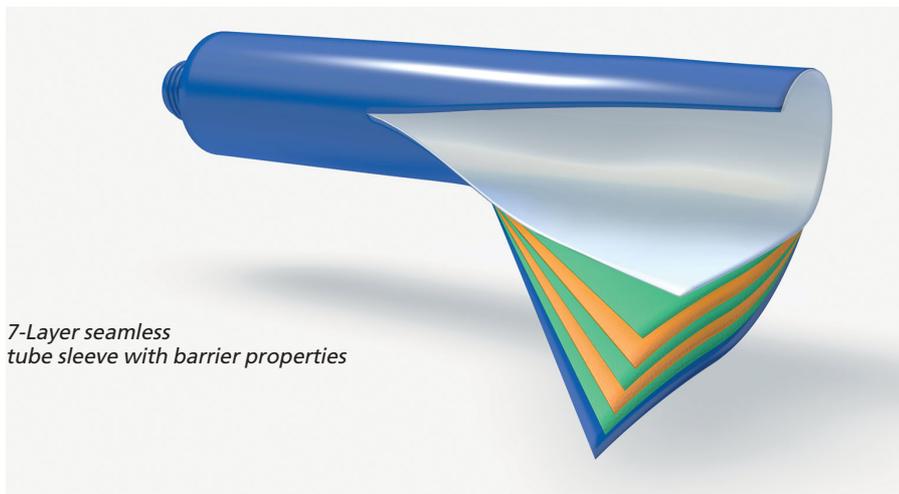
On production side it is necessary to reduce waste and energy demand during production. Breyer's answer is the TopLine, which produces 5-, 6- and 7-layer tubes with maximum performance. BREYER offers unique opportunities to produce packaging in an energy-saving, efficient and sustainable way. After introducing the Multi-Barrier 7-layer tube during K2019, the market response was very positive and

Breyer were able to place several 6- and 7- layer tube extrusion lines in the market. The multi-barrier tube offers 2 separate barriers in a 7-layer configuration. This helps to optimize the barrier characteristic according to the requirements of the filling material.

Also, this high barrier tube came right in time for the growing demand of sanitizing products.

### **Even greener**

Different quality and purity levels of pre-used raw materials require extra skin layers to separate the PCR from the filling or the printing surface. Thanks to the special BREYER technology, up to 86% PCR or PIR can be used in a barrier tube. The PCR material can be separated from the sensitive filling product by adding an additional skin layer inside, containing virgin polymer in a range from 40 to 100µm.



*7-Layer seamless tube sleeve with barrier properties*

Furthermore, an outer skin layer of virgin polymer can be used to separate the printing surface from the PCR. Good printing result require the uniform surface and material to print.

**The advantageous alternative to the ABL tube (Aluminium Barrier Laminate)**

The challenge is to produce coextruded Ultra High Barrier Tubes which are full recyclable. Packaging can be called recyclable if the amount of 2nd or foreign material is below 5%. For cosmetic tubes normally PE is used as the basic polymer and EVOH or PP as foreign polymer. By optimizing the die design and precise manufacturing of the toolings it is possible to reduce the EVOH layer thickness down to 3 to 10 µm, depending on the barrier requirements.

By using two or more different barrier layers, the barrier properties of the tube can be tailored to the requirements of the filling. For example, an outer barrier layer can be combined against the solvents of the printing ink and an inner barrier layer as an oxygen barrier to protect the filling. Even plastic products become sustainable.

Novel plastics based on sustainable, organic materials, such as wood or sugar cane waste, are used. Recycled goods from the own production or third-party processing can also be processed to high-quality products on BREYER systems.



*BREYER TubeFlex multilayer flat film extrusion*



*Calendering system for both side polished film*

**Material savings**

Here is the basic principle: Raw material which is not used, does not need to be recycled. There are several approaches to this. One possibility for material saving is to reduce the total wall thickness. The same tube characterising can be reached by using stiffer raw material combinations without affecting the haptic of the tube.

Another possibility to reduce the material consumption is to use foamed layers. This decreases the weight of the tube and thus also the amount of material can be reduced. The surface structure can be changed so that it can be printed better and also accelerates the handling in subsequent processes (headers, printing, etc.).

**Tube production from flat film**

Compared to the seamless extruded tubes shaped by a tubular die as described above, another kind of tubes are made from a web laminate and have visible side seam.

Laminate film itself is usually supplied by international players of the film industry to the tube manufacturers. High speed film lines, side-seamers and printers allow an economic mass production of such film but the individual design for small orders is not given resp is not economically. Therefore Breyer has developed its TubeFlex flat film extrusion line. The extrusion line with working width of 500 and 1000 mm allow the production of slitted flat film with a flexible configuration of different layers, for different tube diameters and lengths. Barrier layers out of EVOH, PA, PET, COC are also possible.

Furthermore properties as color and haptic which is most important for the first impression of the tube product, can be easily adapted by using different polymers like PET, PP, PA, PE or other blended Polyolefines. An isolated inner layer even allows the usage of recycled material which are not in contact with the product in the tube.

Thanks to the development of inline web printers with digital or analog printing process also small lots can be realized in an economic way.

The advantage for laminate tube producers is that they can now produce their own individual flat film with individual designs with a high flexibility also for small tube order lots. Furthermore the adding value is the in-house production of the film web.



*Surface treatment in the form of Corona is a well-known and acknowledged part of the printing, converting, and laminating sectors of the industry, but it has an even more fundamental part to play in the extrusion process. Giuseppe Rossi is Vetaphone's specialist in this sector and explained the need for the process and how technology is responding to changes in market demand*

*Giuseppe Rossi, Vetaphone's extrusion specialist*



# Surface Treatment for the Extrusion Market

## Vetaphone makes it simple

*Why is surface treatment so important in the extrusion process?*

**Giuseppe Rossi:** It's not so much important in the process itself, as afterwards. To ensure good adhesion of the inks and lacquers during downstream converting processes, the molecular structure of the film surface needs to be modified, and it needs to be done immediately after the cooling phase of the melt before the polymer is completely post-crystal-

lised. By applying the Corona charge at this point to the top layer (to 1-micron deep), we can break the molecular chains and add more oxygen. This alters the surface tension and improves adhesion. The longer you leave it before treatment, the more difficult the molecular chains are to break – in fact, it's often impossible, so timing is critical.

*Are there different requirements for blown and cast film extrusion?*

**Rossi:** Blown film is the more common use for Corona treatment. Because of the high incidence of LDPE in this process and the relatively slow production speed, compared with cast extrusion or any of the converting processes, the Corona system requires only low energy to achieve a good result. The technology in this sector is well consolidated and mature, and with good control allows consistently high-quality film to be produced and treated. Cast film is a far more demanding process because the PP material and higher line speeds require a more complex Corona system layout. Even a single-sided treater (unlike the double-sided in blown extrusion) will typically need higher power, a cooled backing roller, direct drive and a nip roller – effectively a proper pull set up.

There is a third type of extrusion that applies to Bioriented Cast Films like BOPP, BOPET, BOPA, where the width of the line and the high output demands that the Corona unit is contained within the extruder.

*Are the requirements different depending on the material being extruded?*

**Rossi:** Yes, they are. It very much depends on the material and its intended use. How it will be converted after manu-

*Vetaphone Corona treaters were in action at the K 2019 expo in Düsseldorf*



facture brings a number of variables into the equation. For a start, every polymer has its own starting dyne level – that's its ability to adhere inks and lacquers. Some materials, like PVC or PA, require very little power to surface treat to the correct dyne level – PE requires a little more power, and PP is notoriously the most difficult to treat. You also need to allow for the additives mixed in with the polymers, because these can significantly affect the level of Corona treatment needed, and the power consumed.

*With all these considerations, what benefit does Vetaphone technology offer extruders?*

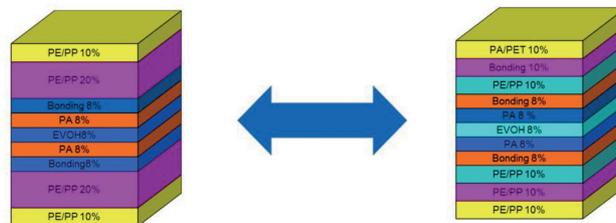
**Rossi:** It's all down to good design, which has been fundamental to Vetaphone equipment dating back to the beginning in the 1950s when the company invented and pioneered what has become known as Corona treatment. Two principles stand out: simplicity and high efficiency. By designing and building a unit that is user friendly, Vetaphone makes cleaning and setting easy with its quick-change cartridge system. If you back this up with high-efficiency generators that use the patented Resonant Circuit, you have the capability of delivering 96% of input power direct to the electrodes. This reduces the heat level, which is an obvious advantage when you are handling lightweight extruded films. There are other factors such as the refined level of control available through our iCC7 interface – but essentially, simplicity and high efficiency are the main benefits here.

*We refer to surface treatment as Corona – is there an application for Plasma in this sector?*

**Rossi:** Not really – but you need to understand the difference between the two processes to know why. Plasma is not a replacement for Corona – it's a different way of treating the surface of certain substrates that require a chemical as well as a physical treatment. It has more of an application in specialised offline converting procedures where the chemical structure of the material is very complex and requires a very high dyne level that Corona cannot achieve. It requires a controlled environment and the use of different dopant gases – and is significantly more expensive than Corona, so used in specialist situations only.

*How has the extrusion market changed in recent years?*

**Rossi:** It's changed because the markets it's supplying have changed. If you go back 20 years, the majority of films being extruded were up to five layers for use in the technical and industrial packaging sectors. Nowadays, with the emphasis more on meeting the ever-growing demands of the food, pharmaceutical and hygiene markets, packaging with up to 13 multi layers are far more common, and the product is required to meet a variety of demands. These include freshness, protection and recycling, and pose complex problems for manufacturers. Take the current dramatic situation with the COVID19



Comparison between 9- and 11-layer blown film

pandemic, which is highlighting the vital role that packaging plays in our daily lives and welfare. Situations like this drive demand for new technology and future applications that enhance the value of so-called 'clever' packaging. And, it all starts with extrusion!

*Plastic packaging seems to be 'Public Enemy No 1' right now – what steps is the extrusion market taking to become more environmentally friendly?*

**Rossi:** Despite public opinion to the contrary, plastic packaging has a very low carbon footprint as far as manufacturing is concerned. But, mindful of its image, and the need to take its responsibilities seriously, I'd say that there are two ways in which extrusion is helping to 'go greener'. The first is in downgauging the packaging by using new resins that allow for less volume of plastic to be used. This helps with problems like shelf-life and hygiene where the extrusion of a special material removes the need for several laminated and heterogenous substrates. The second is the way the industry is working to simplify the structure of packaging by using compatible resins to improve recyclability as part of the circular economy. It's not the manufacture of plastic that is the problem – it's how it's disposed of after use that is the real issue.

*Is this the next big challenge for the industry?*

**Rossi:** Yes, no question about it. As we all know, the EU has set very ambitious targets for reducing the production of plastic and increasing the level of recycling. But it's very difficult to equate the oxygen barrier demand with the sole use of Polyolefin resins. One solution is to extrude bioriented blown films, so-called triple bubble technology, where the orientation of the molecules dramatically improves the properties of the standard resins used in general purpose packaging. The oxygen barrier will not be as good as that offered by EVOH or PA, but good enough to replace much of the packaging where they are currently being used. There are no simple solutions, but demand drives R&D and gives birth to new technology – extrusion is no different in that respect.

*In times where our lives have changed, maybe forever, our business is going to change too. All of us are called to new challenges and to modify our business models to catch new business opportunity. The Italian company UNION Officine Meccaniche is ready for that*



# New Challenges, New Changes!

For UNION it is clear that the market is going to demand for quick actions, to satisfy the need of many companies to change their production, which probably will not be the same anymore. Just to make an example in this sense, UNION got an unprecedented increasing demand of extrusion lines to produce solid PC sheet, optical quality.

These pandemic times, in fact, impose certain changes both in our private and business life that require new products, such as, eyes protections; separators for restaurant's and

bar's tables; separators for gym centers or planes or trains, all in the name of the "social distance".

The UNION solid PC sheet extrusion technology is the answer to these needs and one of the latest advanced line, have just been commissioned successfully in Italy and two more are under construction right now.

The latest news of this technology is represented by a new profile of the screw, new gear pump (made by UNION) and screen changer, that stabilize the process as never before, reducing drastically the pulsations in the die which is a crucial condition, to obtain superior optical quality.

Another great peculiarity of the UNION PC solid sheet technology is the horizontal calender with a pivoting exit roll that guarantee a precise and fast positioning during thickness change, all synchronised in automatic mode.

The positioning of the rolls is secured by an innovative hydraulic system working always in "active mode" and able to guaranteed a tolerance of 0,02 mm only. All the calender rolls are individually driven and equipped of the last generation gears, type "backlash free", with direct coupling to the rolls.

The downstream is equipped with a double longitudinal blade/saw cutting station for the correct cutting of the different thicknesses and with an anti-scratch polyethylene coating system on both sides of the sheet.

The line ends with a rotating saw cross cutter with an automatic stacking device "take&place" type, for sheets up to 6 mt long. The hourly output can be up to 1000 kg/hr, thicknesses from 1 to 20 mm and useful width 2050 mm.

UNION has optimized their production to secure a fast delivery.



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*Processing Technologies International, LLC (PTi) announced the recent sale of one of its Technology Development Center's (TDC) demonstration production sheet extrusion lines. PTi's TDC permits customers to conduct sheet extrusion process trials on brand new full-scale production equipment, often using their own materials to demonstrate the overall equipment performance and related features*

*PTi's new HVTSE® dryerless sheet extrusion demo system, complete with material handling thru 2-up winding, provides Laminex a quick, high quality entry into PET sheet markets*



# Sheet Extrusion Line for COVID-19 Face Shields Provided

This PTi TDC system includes a HVTSE® (high vacuum twin screw extruder) Model 85mm-52D DryerLESS™ extruder, G-SERIES® GSVD661824 sheet take off unit and an ACW6640/2 dual position differential shaft winding system that will be utilized in the production of PPE (Covid-19 related personal protection equipment). It offers an output capacity of 2,200 pph (1,000 kg/hr) and was one of two unique demonstration lines running in the PTi TDC facility – the second of which is a SUPER-G® HighSPEED™

*Laminex's ProTG™ high quality face shields provide PPE to the healthcare industry and individuals alike for protection in the battle against the COVID-19 pandemic contagion*



Model 3000-36D (75mm) system with an output capacity processing PP up to 2,500 pph (1,130 kg/hr).

PTi and its Mexico based sales agent, Grupo Janfrex, began working together as recent as last October and six months later have successfully sold its first line together. The buyer of the line, Laminados Extrudios Plasticos, also known as Laminex, is one of the largest suppliers of extruded sheet in Mexico with an extensive product offering.

Laminex was founded during the Mexican economic crisis of 1993 and prides itself with noteworthy achievements made over the years and during various challenging economic periods, including those recently brought on as a result of the global pandemic of the Coronavirus, oil price market collapse, etc. Laminex credits its success to perseverance of the many employees who have helped carry the company through very tough times.

The current situation has made Laminex move into new markets related to Covid 19, such as sneeze guards, face shields under the label of ProTG ([www.ProTG.mx](http://www.ProTG.mx)) and other medical supply plastic sheet. The new extrusion line will eventually support Laminex's production of sheet for a wide range of industries, including packaging, automotive, point of purchase, refrigeration and construction, etc. Two years ago, Laminex was certified in ISO 9001:2015 with both Mexican and US Certifications.



*Pictured left to right: Brian Winton – PTi Director of Sales; Robert Prewitt – Laminex Plant Mgr., TX; Alejandro Jimenez – Laminex Plant Mgr., MX; Jesus Avelar – Janfrex Sales Agent, MX; Tom Limbrunner – PTi SVP Apps and Tech.; Matt Banach – PTi SVP Sales*

Laminex first started extruding polystyrene sheet for the printing industry. It has since expanded its business to include the production of PE, PS, PP, ABS, PETG and hollow PP (Lamicor) sheet. With the PTi HVTSE® DryerLESS™ system purchase, Laminex can now introduce PET into its manufactured product portfolio and better align itself competitively in the rapidly evolving sheet extrusion market within Mexico. With manufacturing facilities in Guadalajara, Mexico and Fort Worth, Texas, coupled with distribution warehouses in Mexico City and Monterrey, Mexico, Laminex will locate the line in the Guadalajara facility to provide locally produced PET sheet, thus reducing import dependencies with superior sheet quality and immediate availability. Laminex desired to acquire PET sheet extrusion technology that would permit them to compete with anyone in

the marketplace. With PTi’s unique and advanced technologies represented in the HVTSE® DryerLESS™ system purchase, Laminex’s objectives were soon realized. The system’s multi-resin capability provides Laminex the added flexibility to run many resins from one line and features a twin-screw extruder that operates under high vacuum to eliminate the need for drying and crystallizing PET/PLA feed stocks, while removing moisture up to 12000+ ppm (more than twice the normalized undried moisture levels for this geographic region). This technology also allows processing up to 100% regrind materials – a critical component for energy savings and recycling. Precision machinery offering high production rates, combined with flexible resin capabilities and supported by a professional responsive equipment partner like PTi, will help Laminex ascend to the next level as a leading producer of extruded sheet throughout the entire North American markets and perhaps beyond. PTi is currently in the advanced stages of manufacturing the next version of its TDC Line 1 sheet extrusion system, which will feature its latest state-of-the-art technology for multi-resin capabilities including the ability to process several polymers including PET, PLA, PP, PS and PE polymers. The next generation MultiRESN™ DryerLESS™ extrusion technology, will be equipped with a Configurable J-roll Stack with auxiliary cooling rolls, and edge-trim-recovery system, and a variety of other components and features.

Processing Technologies International, LLC, Aurora, Ill., USA  
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# Taiwan Machine Tool Industry Helps Make Taiwan the World's Second Largest Manufacturer of Masks in Just 40 Days

*With COVID-19 devastating world manufacturing now, most factories have either paused work or are slowly recovering. Contrary to most of the world, Taiwan is still able to maintain full staff levels in offices. A part of this result can be attributed to the massive increase in mask production capacity, which now has made Taiwan rank the world's second largest mask supplier*



Such capacity expansion was at first estimated to take six months – much too slow compared to the speed at which COVID-19 spreads. But it ended up taking only 40 days to build up all the 92 sets of automated mask production lines with support from the machine tool industry.

## **Mask production from 2.24 million per day to 13 million**

In late January, COVID-19 had begun to spread globally, and Taiwan was at the front line of the strike. Knowing little about the virus, the government decided to expand mask production capacity so that it would be capable of supplying enough masks for domestic demand, and it needed 92 sets of automated lines which required six months for assembly. These were the replies when the many Taiwan machine tools manu-

facturers heard about the difficulties faced with mask production. Over 80 manufacturers immediately organized to volunteer and send out staff to join in the mask machine assembly. Given that masks were not a common household necessity as they are now, the lack of manpower made assembly of the 92 sets a hard task. The volunteers came in to fill in for the needed workforce, and they also self-produced parts that were lacking for mask assembly. They even assisted in troubleshooting during the test runs. Up to 100 workers were

volunteering on site during the busiest time, and an average of 60 workers were there every day.

Taiwan mask production was at 2 million and 240 thousand masks per day in January, and it has been increased fivefold within 40 days to 13 million in March. Now, 17 million masks are produced per day.

**The new manufacturing trend: Safeguarding factory work with new tech for remote control management**  
By sending staff to support mask production, the corresponding travelling

*“As long as we are provided with the built-up layout, we can assemble it.”*

*“If there’s demand for robotics in combating COVID-19, we will make it our priority to support.”*

*“We can help handle the electrical circuits.”*

and congregation of large groups gathered at the mask production site have created another concern for these 80 machine tool manufacturers. Wearing masks, checking temperature, and sanitizing hands are now mandatory rules at every factory's entrance. In order to ensure every employee is free from COVID-19, many factories are conducting full sanitization every couple day, as well as taking other precaution measures. In addition, the machine tool manufacturers are evolving toward more flexibility at their work by adopting remote monitoring.

After the virus, the global manufacturing chain is rethinking decentralization and one country supply chains, and adopting digitalized manufacturing with remote controlling. This can change the current manufacturing method in order to prevent any more manufacturing downtime.

The IIoT technology adopted on the production platform allows the factory to receive live feed on manufacturing processes and machine status, and the control manager can conduct remote control management (RCM) to assign work programs, either at the control room or simply using their mobile devices. This helps reduce the number of onsite workers



required, while solving manufacturing issues. Several Taiwan machine tools brands are already seeing some good potential in furthering this manufacturing trend even after the virus situation calms.

Aside from the RCM, other non-contact technologies such as augmented reality (AR) could also be used. During troubleshooting, using visualized communication with customers could allow similar results without the need to send a technician to clients' location, and predictive maintenance can be easily conducted that can essentially prevent

machine downtime and lower costs for customers.

By realizing smart manufacturing, humans are not removed from the production element, but instead they are provided with smart tools and more user-friendly interfaces to further strengthen manufacturing efficiency. Undermined by COVID-19, smart manufacturing might have already provided another path for future business.

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*The demand for protective masks according to FFP2 standard, protective covers, and other nonwoven-based products for both the medical and the hygiene sector is growing dramatically in the corona crisis. An even more reliable 100% control in the now rapidly developing new production lines is indispensable*

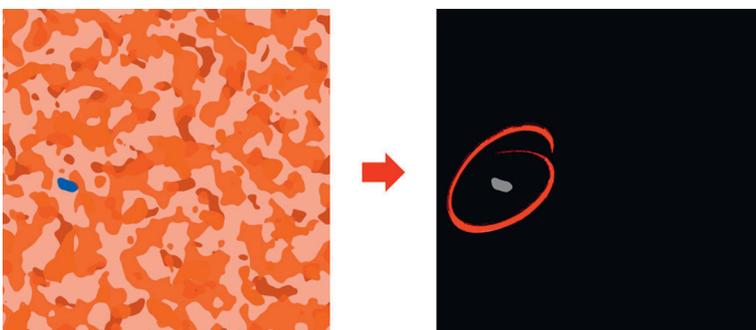
*The ISRA embedded color camera combines the benefits from black and white cameras with the additional detection and classification of color cameras and HDR technology*



# 100% Inspection of Nonwoven Web Material for Medical Protection and Hygiene Products

Since conventional inspection systems for plastic films detect defects using black and white cameras, critical color defects such as oil spots cannot be classified correctly and maybe even missed altogether. To tackle this problem, ISRA VISION has now developed a solution that is unique on the market: The SMASH inspection systems have now been enhanced with a new embedded vision color camera and HDR technology that also detects the coloring of the material and any defects

*Detection and classification of defects is much easier with this kind of color reports*



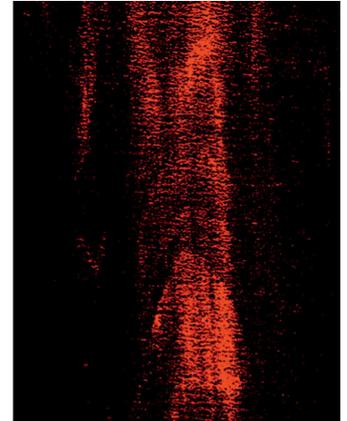
for the best possible classification. In addition to their compact design, the innovative all-in-one modules are highly cost-effective. This is achieved by using fewer and smaller components to enable leaner systems and lower investment costs while aiding integration and simplifying maintenance.

## **The future belongs to color cameras**

In order to be able to reliably detect and distinguish between black-and-white and color defects, it is necessary to have genuine color cameras as opposed to the color LED, given its limitations. ISRA has now introduced a unique embedded color camera in 8K resolution. The revolutionary, intelligent color camera enables a black-and-white and a color image to be generated simultaneously in a single scan. There are no concessions when it comes to resolution – even at high speeds. Compared the competition, which only offers B/W cameras with colored LED lighting, ISRA's genuine embedded color cameras offer real advantages thanks to their additional HDR technology. Dirt, thin areas, and holes in the material can

be reliably detected and classified, delivering crucial advantages over competitors. Instead of just one image, multiple images are captured with varying light intensities seen from different angles. The solution is for manufacturers of a wide range of web products and is suited for a variety of applications. As with the company's image processing hardware and software, ISRA's camera and lighting technologies are designed and manufactured in-house. In this way, all components are precisely tailored to each other and guarantee the optimum in visual intelligence. Quality printing for today's globalized markets poses increasing challenges for manufacturers of plastic films. The competition is growing, as are the expectations of customers in downstream industries.

Flawless product quality is now a must for films intended for use in flexible packaging, separator layers in battery production, and nonwoven products from the food and aseptic, hygiene and pharmaceutical industries. Just as detecting defects through intelligent data analysis and classification, root cause analysis is, therefore, essential in order to identify and remedy the causes of defects in production as part of a

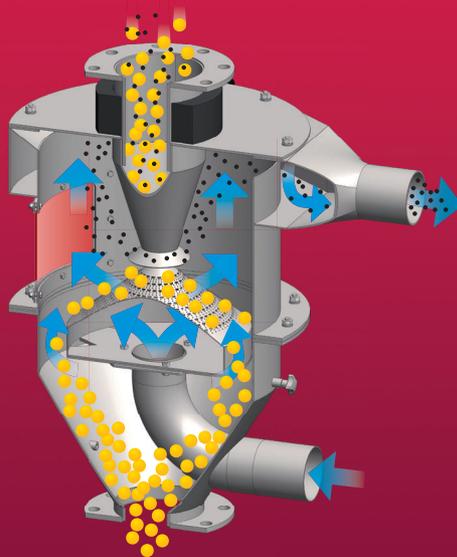


*The ISRA Inspection software makes invisible defects visible to optimize the production process in time*

zero-defect strategy. This is the only way to meet the high standards required in the long term. By doing so, the producer raises both product quality and process efficiency.

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[www.isravision.com](http://www.isravision.com)

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# New Custom Drying System for Complex Plastic and Rubber Extrusions

*UK-based ACI®, a world leader in industrial air movement solutions, has announced the launch of an innovative new profile drying solution that is set to revolutionise the extrusion manufacturing industry. Providing a custom drying solution for complex plastic and rubber extrusions, the Profile Dryer is a compact and efficient system, designed to draw out moisture from unusually shaped profiles such as EPDM rubber extrusions, asymmetric profiles and silicone seals during manufacture*



ACI Profile Dryer – Close up

An important innovation for the extrusion manufacturing industry, the profile dryer uses vacuum technology to remove water without damaging or distorting the extrusions rather than compressed air - which often contains oil and water. In addition to achieving high levels of drying efficiency, ACI's profile dryer offers major reductions in running costs through lower energy consumption – utilising a 1.5 Kw or 3 Kw motor – and the ability to capture coolant on the extrusion.

The Profile Dryer unit is fully enclosed with a small footprint of just 1,300 mm long, which easily fits into most production lines. The main enclosure contains a side channel blower and cooling fan as well as a water separator which collects coolant for recycling. The unit is made from stainless steel with ceramic rollers, eliminating the risk of corrosion. To suit customers' requirements, the drying head can be configured to meet individual specifications.

Designed for intricate and specific profiles, the solution is capable of drying extrusion of up to 65 mm in diameter, and is particularly suited to production lines where water collection or spray containment is essential. Drying speed varies with profile size, but smaller profiles of 0.2 to 6 mm can achieve a drying speed of up to 100 metres per minute.

ACI Managing Director, Chris Heller, said: "Following the release of ACI's highly anticipated Cable Dryer, we are pleased to announce our latest innovation for the extrusion market – the ACI Profile Dryer. Our highly skilled team has developed a product that offers a solution to many of the issues associated with traditional profile dryers. Our blower-driven units greatly reduce noise levels and significantly cut energy consumption compared to compressed air nozzle arrangements. After a long period of development, we're excited to bring this solution

to market as we truly believe that it will be transformational for the extrusion manufacturing industry."

Typical drying applications for the profile dryer include EPDM, nitrile rubber extrusions, PVC, plastic extrusions, silicone seals, profiles, tubes, pipes and bars.

ACI is a world leader in the design, innovation and manufacture of industrial air movement products for the cable, wire and extrusion industries, supplying and supporting a global audience directly and through an extensive network of distributors.

ACI has a proven track record in air movement engineering, a history that goes as far back as the 1960s. Based in Axminster, Devon (UK), ACI also has a sister company in Windsor, Maine (USA). Established in 2008, this facility was set-up to support increased demand in North America. For more information:

**Air Control Industries (ACI)**  
[www.aircontrolindustries.com](http://www.aircontrolindustries.com)

*Plastic recyclates produced from waste packaging have to meet high sensory requirements in order to be used for new products. Plastic recyclates often have off-odors, some of which have not hitherto been identified. The Fraunhofer Institute for Process Engineering and Packaging IVV (Germany) has analyzed the sensory properties of post-consumer shopping bags made of low density polyethylene (LDPE) and originating from different collection systems*

## Reduced Off-Odor of Plastic Recyclates via Separate Collection of Packaging Waste

More than 60 odorous substances were identified using combined chemo-analytical methods. The information gained provides a targeted strategy for avoiding off-odors. The results of this collaborative study with the Chair of Aroma and Smell Research at the Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany) and the University of Alicanet (Spain) have now been published.

In order to meet the targets of the new EU Packaging and Packaging Waste Directive concerning the recycling of packaging waste, new markets for recyclates produced from waste plastic packaging must be found. Recyclates produced from waste plastic packaging must have no off-odors if they are to be used as secondary raw materials for the manufacture of high-quality consumer products. Indeed, the off-odors in plastic recyclates prevent a closed cycle for the recycling of plastic packaging materials. Currently, there is a particularly high reuse rate for recyclates produced from polyethylene terephthalate (PET) bottles.

### LDPE packaging waste in focus

The Sensory Analytics department at the Fraunhofer IVV characterizes and optimizes plastics and recyclates. The odorants in HDPE waste and the recyclates produced from packaging from bodycare products and detergents have already been analyzed. Low density polyethylene (LDPE) is one of the most commonly used plastics. It is widely used for packaging materials such as plastic shopping bags. Via various collection systems these bags end up as packaging waste. Part of the current study on post-consumer LDPE shopping bags concerned the effect of the collection strategy on the sensory impairment of the waste.

### Identification of odorants – the key step

Identification of the substances causing off-odors is essential in order to be able to take measures for odor optimization. Most of the odorants identified in the study are typical metabolites of microorganisms. Many of these metabolites had a cheese-like or feces-like odor. The odorants included carboxylic acids and sulfur-containing and nitrogen-containing components. The chemical structures of the odorants gave key insight into their origin. Using this information, the pathways into the packaging waste and via the recycling process into the recyclate were identified. Depending on which process step cannot remove an odorant or

*Separate collection is beneficial for the sensory properties of the plastic waste and hence the quality of the resulting recyclates*  
(© Fraunhofer IVV)



even results in a new odorant, targeted measures can be taken to reduce odorants or avoid the formation of new odorants.

### Odorant reduction via separate collection in the yellow bag

The study showed that the way the packaging waste is collected has a large bearing on the odor quality of plastic shopping bags. There are significant benefits by separate collection in the yellow bag. Waste collected in this way had a significantly lower overall odor. In contrast, the waste fraction collected in the general household waste had more intense cheesy-like, sulfur-like, and feces-like odors. The higher organic fraction in the general waste favors the formation of these microbial degradation products. It was also demonstrated that the post-consumer LDPE shopping bags from the separate collection that were washed at 60 degrees had fewer odorants and a reduced overall odor than the unwashed bags.

### Methods for odor identification in plastic waste

The Fraunhofer IVV scientists used sensory analytics to identify the odors. Sensory evaluation of the sample materials was first undertaken by a trained sensory panel. The odorants were then identified using chemo-analytical methods such as gas chromatography – olfactometry and with two-dimensional coupling with mass spectrometry. This enabled the chemical structures to be determined and also possible formation pathways and sources of the odorants to be identified. These key findings can now be used to develop customized solutions for optimization of the odor of plastic recyclates, starting at the waste collection stage.

► Fraunhofer Institute for Process Engineering and Packaging IVV  
Giggenhauser Str. 35, 85354 Freising, Germany  
Dr. Philipp Denk, philipp.denk@ivv.fraunhofer.de  
www.ivv.fraunhofer.de

*Plant design automation and technology advancements lead to increased purity rates, while requiring fewer manual sorters*



## New Sorting Technology Can Help Overcome Recycling Business Disruptions

The rapidly evolving effects from the novel coronavirus, COVID-19, global pandemic has governments and companies enacting unprecedented measures to protect the lives and livelihoods of the populace. Emergency social distancing and quarantine orders to flatten the curve of transmission rates have been enacted globally. The “non-essential” workforce is recommended, ordered in some cases, to stay from home, using technology to work remotely. Meanwhile, some essential services workers are receiving increases to their hourly rates as hazard pay.

### **Recycling industry feels the pinch**

Deemed essential services in many countries, the waste and recycling industries face virus-related impacts, as collection services and practices are being altered to protect workers. Receiving recyclable materials has a high rate of interaction with the public, and the recycling process often involves close worker interaction.

As a result, many locations around the world have temporarily halted

collection of a portion or all recyclable materials. In the United States, Michigan and South Carolina facilities have halted the collection of recycle materials placed curbside, turning to landfilling instead. In the United Kingdom, where recycling centers are not considered “essential,” some councils have reduced bin collection services, while others have closed recycling entirely to prevent close contact among people and possibly spreading the virus.

To mitigate the inherent risks associated with coronavirus, the U.S. Department of Labor’s Occupational Safety and Health Administration (OSHA) has issued the general safe practices guidelines of frequent handwashing with soap and water, use of hand sanitizer, avoid touching the face with unwashed hands and avoid close contact with those who are sick. At the time of writing, OSHA recommended that waste agencies handle solid waste with potential or known COVID-19 contamination like any other non-contaminated waste – use typical engineering and admin-

istration controls, safe work practices and personal protective equipment (PPE), such as puncture-resistant gloves and face and eye protection, to prevent worker exposure to the waste and recycle materials managed.

To minimize worker interaction, recycling companies are adjusting business practices, such as moving to staggered collection shifts, to prevent virus exposure. Manual sorter repositioning and staggered breaks have been implemented for social distancing. Where sorter repositioning is not possible, temporary barriers between workers are being placed where advance safety.

### **Strain on supply**

Consumer buying and recycling habits in Europe have seen a spike in virgin PET demand, combined with decrease return rates, taxing the recycled polyethylene terephthalate (rPET) market, the most widely recycled plastic in Europe. French recycling operations anticipate reduced collection rates for polyethyl-

ene and polypropylene as well, at a time when the market typically sees the start of peak season for rPET and recycled polyolefins.

A vast majority of U.S. states with bill deposit programs have suspended enforcement, limiting the returns of aluminum cans as well as glass and plastic bottles. Still other states have stopped drop-off programs at recycling facilities and reduced facility operating hour reductions to combat the virus.

#### Automation and technology advances

It is said that necessity is the mother of invention. In times of social and business disruptions, people find ways to overcome the challenge. We are seeing this play out with the coronavirus pandemic. Displaced students are learning virtually, quarantined citizens are finding virtual ways to stay connected and “non-essential” workers are keeping business running through work-at-home initiatives.

The waste and recycling industries face the compounded issue of material and labor shortage trends for the foreseeable future. Recycling operations must make the most with the material they receive, with fewer workers. “Advancements have been made in sorting circuit automation at both front and back ends, which have helped recycling operations decrease the number of manual sorters while increasing material purity,” mentions Fabrizio Radice, Head of Global Sales and Marketing TOMRA Sorting Recycling.

China National Sword in 2017 started the innovation engine for plant

builders and manufacturers of equipment used at MRFs and metal recycling yards. Before National Sword, recycled product with up to 10 percent impurities was acceptable. After, impurity content of no more than 0.05 percent was mandated, and other countries eventually followed China’s lead. “The industry has grown from material recovery to recycled product refining,” says Eric Thurston, Sales Manager Metals for TOMRA Sorting Recycling. “Companies want the sorting circuit to do the majority of the work, so they can redirect manual sorters to better utilize the talents.”

Equipment automation is helping to deliver better separation of mixed materials at the front end of the recycling circuit. “The better the separation at the front end, the more efficient the back-end sorting will be, and the fewer manual sorters will be required,” comments Thurston.

On the circuit’s back end, where material is sorted into final products, significant improvements in equipment technologies are helping to reduce the number of manual sorters required for final product quality. Sensor improvements now enable optical sorters to pick out fine molecular differences in PET and paper materials to get a cleaner product sort.

“By taking a systems-thinking approach to the entire circuit and upgrading both the front and back ends,” says Nick Doyle, Recycling Area Sales Manager, West North America for TOMRA Sorting Recycling, “we are helping MRF operators significantly decrease their manual sorter count, in some cases by 50 per-

cent or more. This is not only beneficial in current times with the coronavirus pandemic, it better utilizes worker talents and saves operators substantial sums of money annually.”

#### Digital trends

Today, more of the recycling circuit’s components can be networked together to further advance efficiencies. Sorting machines can capture operating data, such as when the circuit is running, duration, output and service alerts, that can be accessed remotely via an Internet connection. This allows managers to employ fact-based decision making about the equipment and circuit, improve operating efficiency and increase sorting accuracy.

More available data combined with significantly improved computing capabilities has expanded the use of artificial intelligence (AI) in sorting equipment to help recycling operations solve much more complex sorting problems than in the past. Robotic sorters and sensor-based sorting equipment are now integrated with advanced machine learning capabilities to recognize patterns in the waste stream and make a smarter sort. Doyle suggests that operators consider pairing advanced optical reducing sorters with robots using AI to help boost quality, while the need of manual sorters.

As a final consideration as to whether a circuit should be upgraded to improve sorting accuracy, Doyle offers, “If it hasn’t been upgraded within the last three years, it may not be as efficient as possible, and a company might be using more manual sorters than necessary. Investing in the circuit now, when volume and labor availability are down, can help to reduce the impact on the business and pay dividends when the business rebounds to pre-pandemic levels.”



**TOMRA Sorting GmbH**  
 Otto-Hahn-Str. 6, 56218  
 Mülheim-Kärlich, Germany  
[www.tomra.com/recycling](http://www.tomra.com/recycling)

# Simple and Efficient Dosing

*ALEKO Machinery is a manufacturer of volumetric and gravimetric dosing systems with extrusion control function and high accuracy of dosing of the material (0.04%). Both models of dosing systems are highly demanded among factories in Russia, countries of Central Asia and Eastern Europe*

The advantages of using automatic dosing systems are obvious, because this solution allows to reduce the influence of the human factor on the production process, save raw materials due to a more accurate evaluation of its consumption, as well as obtain programme reports. All this helps to improve the quality of the final product, plan the material supply and optimize financial costs, especially when it comes to processing of complex multi-component formulations. Aleko, the largest Russian manufacturer of equipment for the processing of polymers, offers several options of automatic dosing systems that are designed to perform various tasks and different accuracy of adherence to the formulations. Conveniently, each of the described devices has a remote connection facility and remote adjustment.

## Gravimetric dosing

When it comes to a high accuracy of dosing, and working process is carried out with small portions of ingredients, the gravimetric dosing system from Aleko with the function of control of the whole extrusion process is the optimal solution. It has a high dosing accuracy (up to 0.04%). This device is a must-have when manufacturing products where formulations comprise expensive materials, as well as highly concentrated masterbatches and functional additives.



*Aleko volumetric (on top) and gravimetric dosing system*

The operational principle of Aleko dosing systems is based on the supply of material in portions of a certain weight in accordance with the formulation: the component is fed to the hopper, where it is weighed (portion dosing accuracy of 0.04%), after that, the following components are fed in turn. After weighing all the ingredi-

ents that make up the formulation, they are blended in the mixing hopper. Upon reaching the user-specified maximum weight, the material is supplied into the feeding zone of the screw.

After the announcement, these systems immediately attracted the attention of specialists, which confirms the growing market demand for inexpensive, but at the same time high-quality solutions for the automation of production processes.

## Volumetric dosing

Aleko volumetric dosing system was designed and introduced to the market 5 years ago. This system is an excellent solution for companies applying  $\text{CaCO}_3$  fillers in order to reduce the cost of the final product. It is convenient to use volumetric dosing systems in order to mix up to four components of various density (density of polyethylene 0.91 to 0.95  $\text{g/cm}^3$ , and  $\text{CaCO}_3$  fillers – 1.8  $\text{g/cm}^3$ ), while the dosing accuracy less than 1% is not required.

The operational principle of volumetric screw dosing systems "Aleko" is supplying of a given amount of material for a certain time in accordance with the formula.

Dosing is carried out by a screw element by moving the material into the inter-turn space. Auto-proportional supply of mixed raw materials ensures continuous feeding of extruder and obtaining required characteristics of finished products. The simple installation and operation of the Aleko volumetric dosing systems is combined with easy modifications in configuration: the structure of 1 + 1 dosing system (one main plus one additional component) can be easily transformed up to 1 + 4 (one main plus four additional components).

Both types of dosing systems have proven themselves, but the designers keep upgrading them to meet market needs. For example, the new design of the weighing hopper makes it easy to modify the dosing system from four to six-component – unlike the analogues offered by competing companies.

#### Material supply and extrusion control

Continuing the development of the product line of dosing systems, Aleko company has expanded the range with extrusion control feeding system, area of the screw.



*Aleko extrusion control system*

which enables automatic adjustment of the feeding, screw rotation and take up speed in automatic mode, which makes it possible to clearly set the weight per linear meter of the film and maintain it throughout the entire extrusion process.

The extrusion control system is equipped with a loading hopper, which supplies the material to the weighing tank, where tension sensors record the value of the weight of the supplied batch. Then the raw material is fed into the feeding zone

Optionally, the system can be equipped with a raw material mixer for pre-mixing portions before feeding it into the screw.

The described system at a low cost allows to achieve a high degree of automation and production stability where dosing of a large number of components is not required.

By optimizing the work of designers, production technology and its localization in Russia, as well as through a careful selection of components, Aleko specialists can offer customers affordable prices, but at the same time high-quality solutions for material dosing systems, which have received very positive feedback in the market.

Aleko Machinery  
<http://en.polimerexpert.ru/>

# ALEKO

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### Gravimetric dosing systems

- ✓ portion dosing accuracy up to 0,04%
- ✓ automatic control of raw material supply, rotation speed of extruder, take off
- ✓ primary weighting of each component and following weighting of ready batch before unloading of material



### Volumetric dosing systems

- ✓ one component dosing accuracy: 1%
- ✓ continuous feeding of raw material with multiple density
- ✓ 1+1 type dosing system can be easily upgraded to up to 1+4 type



### Extrusion control system

- ✓ automatic control of raw material supply
- ✓ control system of screw speed by changing the internal pressure in the barrel of extrusion line
- ✓ an adjustment unit of the take up device by controlling parameters of the linear meter

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# Producing 320-Liter Hydrogen Liner in Blow Molding Process

*Kautex Maschinenbau's blow molding experts have successfully produced a large-volume polyamide liner for hydrogen pressure vessels using extrusion blow molding. The liner is more than two meters long, with a diameter of approximately 500 mm and a volume of 320 liters. This is the first time that a liner for a hydrogen container has been produced in this size by blow molding*



*Prototype production in the Kautex Composite Center  
(All pictures © Kautex Maschinenbau GmbH)*

Hydrogen presents considerable challenges in relation to the liner material's permeability. Being the smallest molecule in the periodic table, hydrogen can diffuse through virtually every plastic material. Special polyamides (PAs) have the best barrier properties. However, due to their low melt rigidity and complexity, they have previously been difficult to process on this scale by blow molding. Newly developed polyamides and a special extrusion

technique have now made this possible.

"Producing a liner of this size from polyamide has been a major challenge. The work we are doing here is truly pioneering", said Abdellah El Bouchfrati, Head of Kautex's Composite Business Development, where the new hydrogen liner was developed.

For some time now, Kautex has been putting its efforts into on-going development of composite pressure

vessels (CPV) for various applications such as hydrogen, CNG and LPG tanks. Composite tanks consist of a thermoplastic liner, a boss part, to which the valve is connected, and a fiber winding which adds mechanical strength. The internal liner is produced by blow molding.

CPV high-pressure containers for hydrogen are generally designed for an operating pressure of 700 bar and a burst pressure of 1750 bar. The liner is a core component of the container.

*320 l hydrogen pressure vessel*

*Blow-molded PA liner*



It is the inner skin of the tank. It absorbs the gas, surrounding the contents and sealing them off from the outside. The liner is subjected to high mechanical stresses and temperature ranges from  $-60\text{ }^{\circ}\text{C}$  to  $+120\text{ }^{\circ}\text{C}$ . Now, for the first time, the method developed by Kautex in cooperation with a plastics manufacturer enables hydrogen liners in sizes with industrial applications to be produced by blow molding.

"The liner size we have now achieved is just the start. We are confident that, in future, we will also be able to use this method to produce considerably larger liners for hydrogen pressure vessels", said Abdellah El Bouchfrati.

The technology developed by Kautex Maschinenbau for producing large-volume liners for hydrogen containers means that a cost-effective solution for transport and infrastructure requirements is now within reach. Experts have long considered sole reliance on battery technologies to provide a solution to tomorrow's mobility problems will not achieve the long-term goal of mobility that is as carbon-neutral as possible.

While fuel cell technology in the passenger car sector does not yet appear to be economically viable, due to pro-



*Kautex KBS241 extrusion blow molding machine*

duction costs and a lack of infrastructure, hydrogen-powered drive and production technologies are already being successfully implemented in other areas. This technology currently appears to be of particular interest for heavy goods transport, local public transport, shipbuilding, and the aircraft industry. In those sectors, the primary demand is for safe, light-weight and leak-proof tank systems.

CPVs are not only significantly lighter than steel tanks, but also completely resistant to corrosion.

Hydrogen is also a first-class energy storage medium, especially if it has been produced using renewable energies. Here, too, tank systems that can withstand the associated pressure, and still store the extremely light gas safely, are needed.

Alongside high-tech machines for packaging and automotive products, the company also develops systems for producing thermoplastic pressure vessels. Kautex Maschinenbau's portfolio ranges from the development and production of prototypes and small series to the construction of complete production systems for manufacturing composite pressure vessels. Working together with its customers and materials manufacturers, Kautex continues to advance developments in CPV technology. The hydrogen liner that has just been unveiled is the latest fruit of this cooperation.

*Quality inspection in the Composite Center*



*Black specks and color deviations often lead to increased scrap rates in the production of plastic injection molded parts, but also in the manufacture of profiles, cables and pipes. The same applies to metal inclusions in the pellets, which leave traces in the end product and the processing machines and cause costs. As far as black specks are concerned, this type of material contamination is often caused by thermal overload, whereas metallic contamination often originates in the cutting tools of the pelletizing plants*



*Cross section of an extra-high voltage cable with discharge*

## Inspection and Sorting of Plastic Pellets as a Guarantee for Visually and Functionally Perfect Products

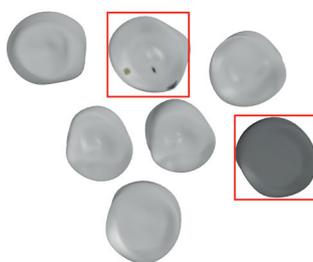
The cause is often sought in the machines and processes, while the raw material is rarely included in the analyses. Risks resulting from contamination are breakdowns in high voltage cables and damage to the mold in injection

molding systems. In this respect, a continuous quality control in the production process that fulfills a 100 % control of the amount of pellets to be processed is essential. SIKORA AG has developed a special online inspection and

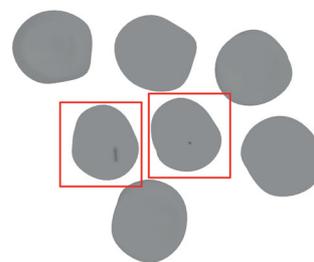
*Examples for plastic contamination (left): The optical cameras detect visual defects on the pellet's surface as well as color deviations (center). With an X-ray camera, metallic contamination inside the pellet can be detected (right)*



Plastic pellets with contamination



Contamination detected by optical camera



Contamination detected by X-ray camera

sorting system that combines X-ray with optical technologies and, therefore, automatically detects and separates color deviations and metal inclusions down to a size of 50  $\mu\text{m}$ . By using the system, repairs and follow-up costs can be avoided and costs for machines and personnel as well as down times and scrap can be significantly reduced.

### Quality assurance at plastic manufacturers, compounders and processors

Smallest process variations in compounding plants can already cause changes in the technical and optical characteristics of the pellets and the future product. Thermal and mechanic overloads of the polymer, contamination caused by the production environment or a work overload of the staff can result unnoticed in contaminated pellets in the form of black specks, yellowing, burns, metal, dust etc.

During pellets sampling, which is a common method for the industry, contamination often remain undetected because the sample amount in relation to the delivered quantity and to the actual amount of contamination is too low. Furthermore, contamination can occur pooled in one or several bundles and also homogeneously spread over many bundles. Therefore, the taken samples are mostly used for simple offline incoming goods inspection. In the past, plastics with optical defects or contamination were often sold with discounts to compounders or processors. The goods were modified or processed into other compounds with lower dosage. Alternatively, they were processed into products with non or only small optical demands. Charges with metallic contamination were demetallized by means of inductive metal separators and reapplied for a new purpose. While first optical sorting systems were primarily designed and used in Europe in case of an emergency scenario at the manufacturers, a service sector in the area sorting has been developed since the 2000s. The pellets to be sorted are transported to the service provider in their target packaging, where they are optically sorted, newly packed in original bundles and picked up again from the manufacturer a few days later.

This procedure is inconceivable for manufacturers of high quality and extremely pure raw material such as polyethylene for cable applications. The quality demands in the area of e+e (electric + electronic), in medical or aerospace are that high that any risk of foreign contamination must be eliminated in order to avoid image and consequential damages in the millions. In addition, for mass production of plastics with very high quality demands and for compounders of technical raw material, a 100 % online inspection with automatic sorting is required.

### Online inspection and sorting of plastic pellets

The online inspection and sorting system developed by SIKORA AG does not only use optical technologies, but also combines those optionally with an X-ray camera.



*The online inspection and sorting system detects metallic contamination inside the pellet as well as black specks and burns on the pellet's surface*

Therefore, even the smallest, in raw material included metal particles can be detected by the system. Furthermore, black specks and color deviations are detected by the optical cameras. Faulty pellets are separated immediately after detection via compressed air.

The integrated software provides the operator with a statistical evaluation with information about the size, area and number of the detected contaminants during production. In addition, impurities are saved in an image gallery. The image information often gives a conclusion about the reason for contamination and support the operator in the optimization of the production processes. The recorded data is permanently retrievable and can be separately evaluated at any time.

The relevant size for the detection of pellet defects required by manufacturers and compounders has been approx. 100  $\mu\text{m}$  since the 1990s. Due to further technical developments, resolutions from 35  $\mu\text{m}$  or even lower have been possible for some years now. A high resolution, however, is not a guarantee for the elimination of black specks, color deviations and metal inclusions. A safe subsequent sorting process firstly requires a high detection probability. SIKORA AG offers this as a unique feature by using up to four optical cameras and an X-ray unit. Depending on the expected contamination and application,

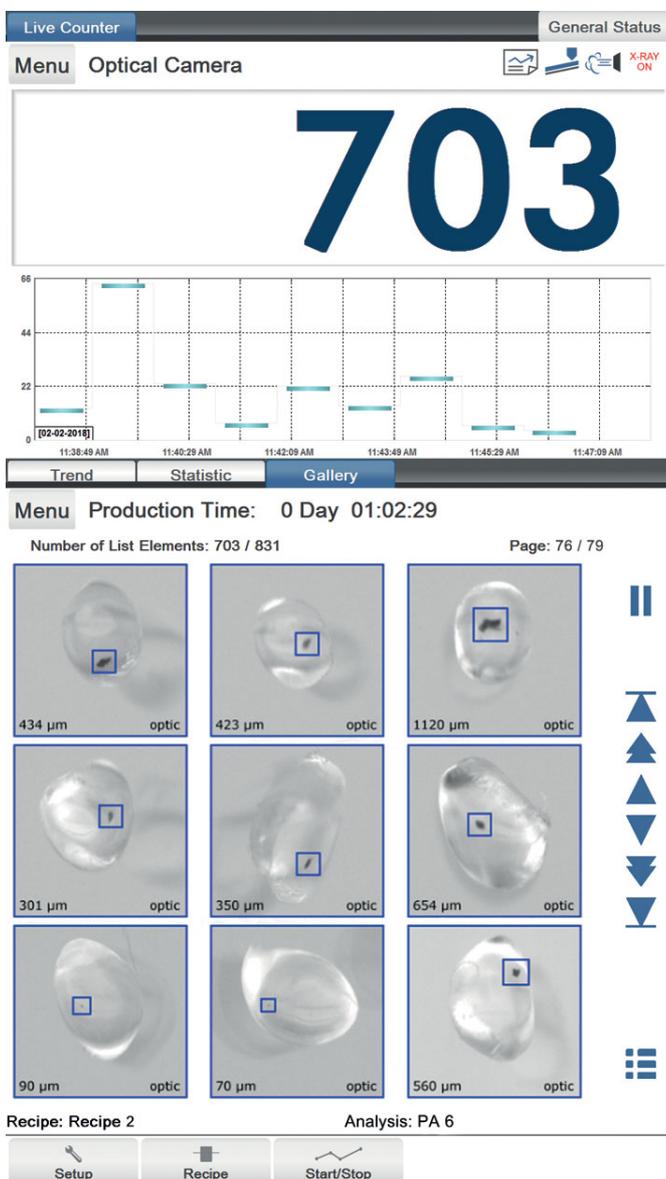
the system is configured before dispatch according to the requirements of the operator. It detects and sorts out contamination down to a size of 50  $\mu\text{m}$ .

### Benefits of optical separation and demetallization

With the described system, manufacturers and processors of plastic pellets can test the produced or purchased goods to 100 % and separate optical defects as well as metal inclusions. The arising benefits lead to a reduction of:

- Production rejects
- Machine downtimes
- Repairs and post-processing of machines and tools
- Electrical breakdowns (for cables)
- Hot channel damages and distribution blockage (for injection molding)

Gallery view of detected contamination by the online inspection and sorting system



- Replacement purchase, additional freight, energy costs, setup time
- New processing of replacement material
- Additional personnel costs due to extra worktime
- Recycling and disposal costs
- Image damage and customer dissatisfaction

Consequently, the delivery capability can not only be obtained, but can also be improved because unpredictable risks due to metallic contamination or no longer melting polymer burns can be eliminated. This is an important aspect especially for safety relevant products in the medical, aerospace and automotive area in order to prevent product failure. Furthermore, for the e+e section, it can be pointed out that with the reduction of black specks also a reduction of breakdowns can be achieved. Therefore, black specks are not only responsible for visual defects, but often also for functional defects.

### Conclusion

Only if flawless raw materials are being processed, common subsequent defects in subsequent processes can be reduced or avoided. Consequently, the highest possible cleanliness of plastic pellets is of significant importance for compounders and processors alike. It is the prerequisite to avoid waste and to protect natural and economic resources as well as the environment. Simultaneously, the quality can be significantly improved for processors and finally the consumers.

In this respect and due to the continuously increasing quality requirements of the plastic processors, the demand for online inspection and sorting systems will further grow. New tooling technologies as well as ever decreasing cross sections in the hot channel and distribution system set higher criteria regarding the raw material to be processed. These requirements can only be fulfilled by future oriented technologies such as the system developed by SIKORA AG. By means of optical cameras and X-ray technology, the system detects online and automatically sorts out black specks, color deviations and metallic contamination down to a size of 50  $\mu\text{m}$ , and thus guarantees so far unmatched quality.

### Authors

*Hilger Groß*, Business Development & Sales Manager, and  
*Rebecca Zachau*, Corporate Communications SIKORA AG

SIKORA AG  
Bruchweide 2, 28307 Bremen, Germany  
[www.sikora.net](http://www.sikora.net)



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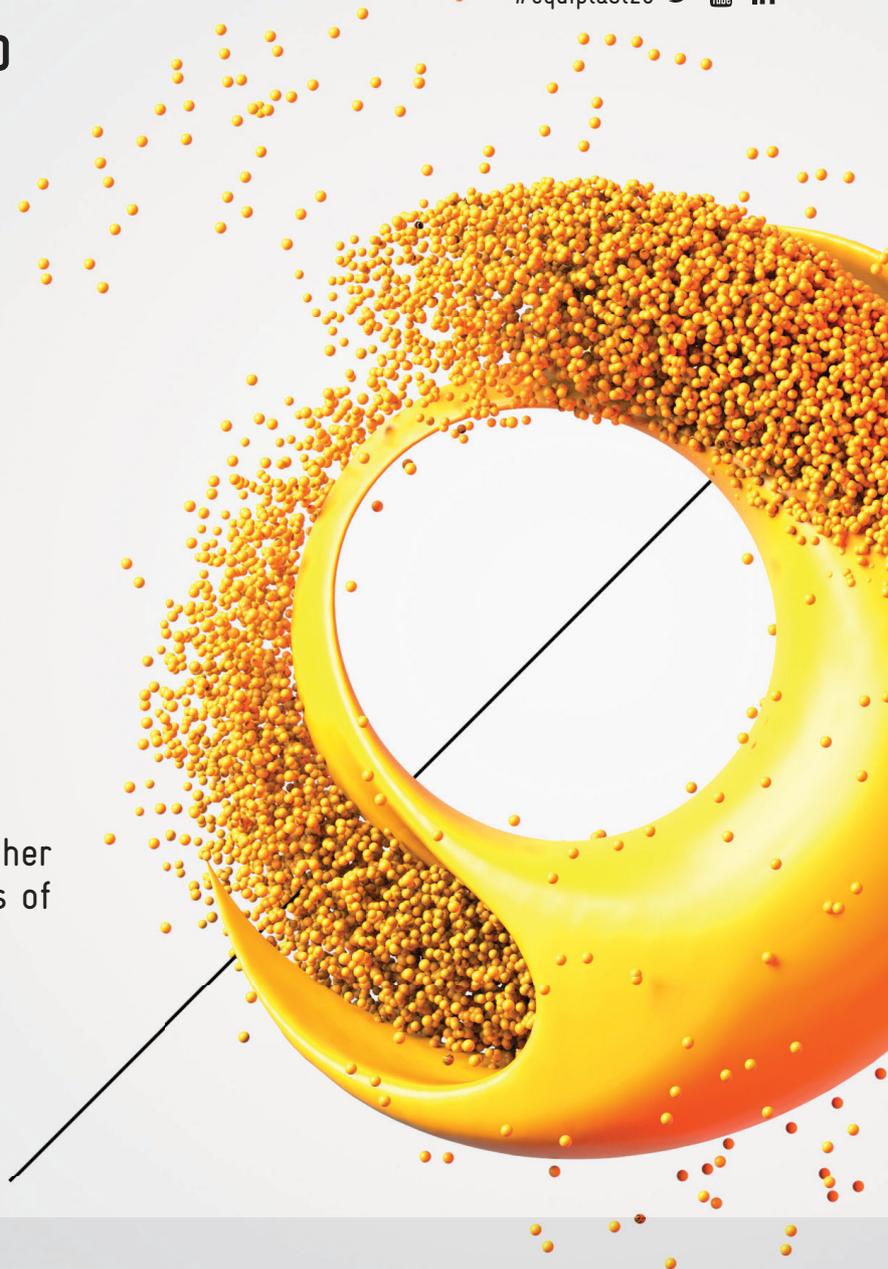
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