

03/2023

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EXTRUSION INTERNATIONAL

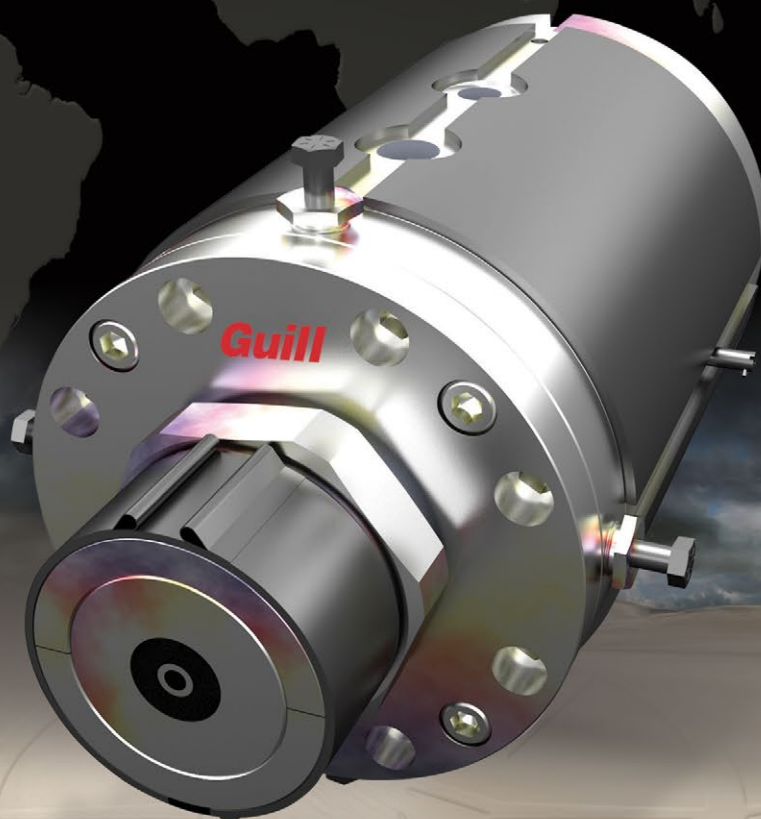


Guill

WORLD LEADER IN EXTRUSION TOOLING

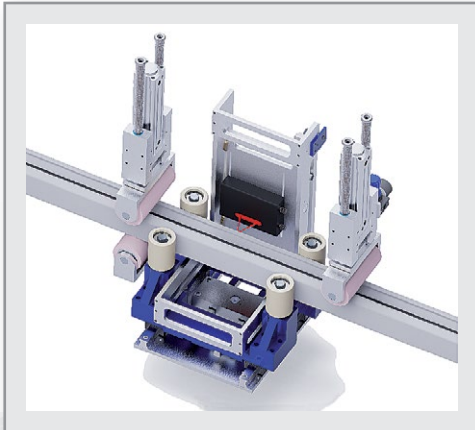


Spiderless Pipe Dies — 2" to 15" diameter tubing



www.guill.com/series/900-series

Stein Profile Stacker



Profile length measurement during extrusion

Measuring sensors are used to determine the length of individual profiles before a profile layer is formed.

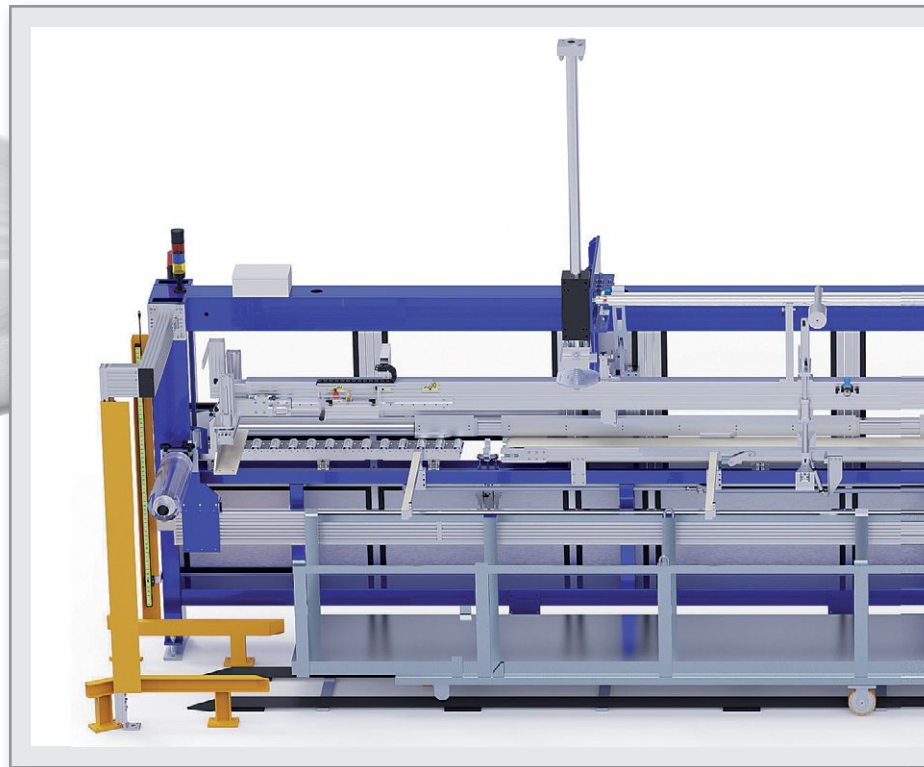
The measured length can be used to check and correct the cutting device of the extrusion line or for documentation (quality assurance) of the produced profile lengths.



Stacking of special profiles

Stein Maschinenbau offers technical solutions for stacking of heavy and large monoblock profiles.

Based on decades of experience, we can evaluate unusual profile geometries or special layer for their automated stacking.



Cassette spreader

With the help of a cassette spreader it is possible to realise the same packing density of the manual packaging.

Stein Profile Stacker



Weight determination during extrusion

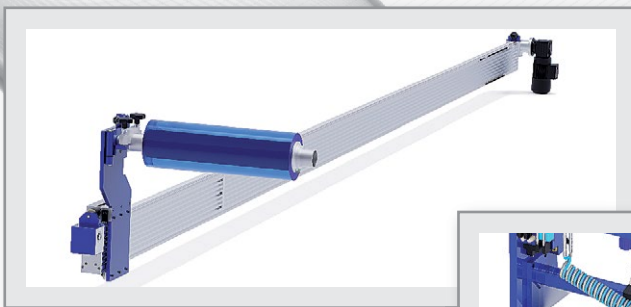
With the help of special weighing units, individual profiles can be weighed before a profile layer is formed. The determined weight can be used to optimise the extrusion.

As a specialist in the field of special machine construction, we always find a solution!



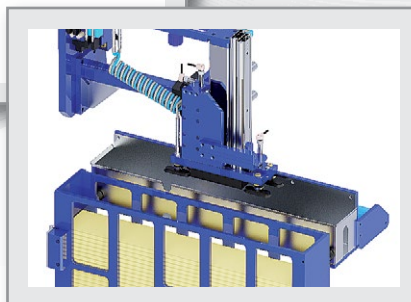
Cassette handling

The handling system allows empty cassettes to be fed into the automatic stacker and the filled cassettes to be pushed out.



Profile interlayer

Endlessly laid as a foil between the profile layers or with individual strips laid on the layer.



**STEIN Maschinenbau
GmbH & Co. KG**

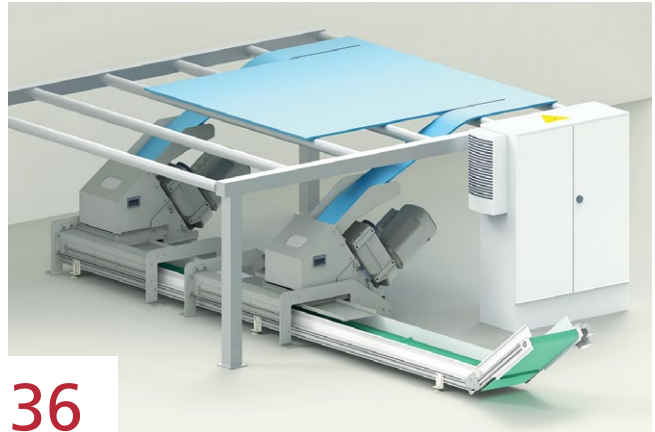
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Recycling plastics in a way that is both economically successful and makes ecological sense is something that was hardly imaginable for many just a few years ago. EREMA – like the sustainable packaging manufacturer Polykar in Canada – became a pioneer in its field through its early entry into plastics recycling



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In film and plate extrusion, particularly tough edge trims come up every now and then. To condition this material for processing in hopper granulators as efficiently as possible, it must first run through the process step of coarse crushing. Adapted to this, GETECHA supplies a range of powerful foil cutters and choppers



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Llorens offers its customer an extensive service, from collection, preparation to the reuse of industrial waste. The company has several modern reprocessing and recycling lines and decided to add a Melt Filtration System from Gneuss as a fine filter in order to remove contaminants down to 56 to 100 µm

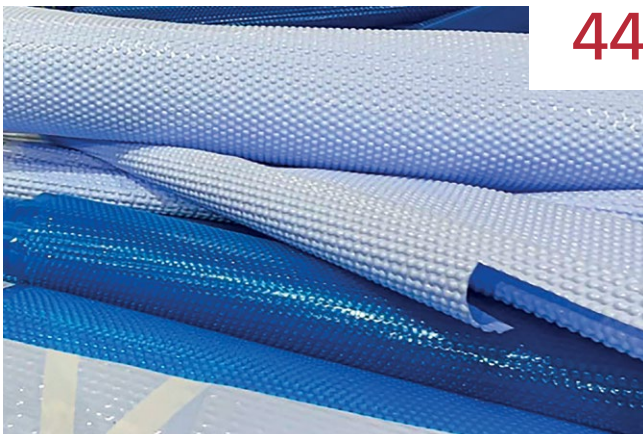
Any manufacturing and production process will no doubt produce waste in some form. So does Plastipack, a producer of high-quality plastic swimming pool covers and water storage systems. By the help of a WEIMA two-stage size reduction system, plastic scrap is recycled directly on-site – for a closed loop



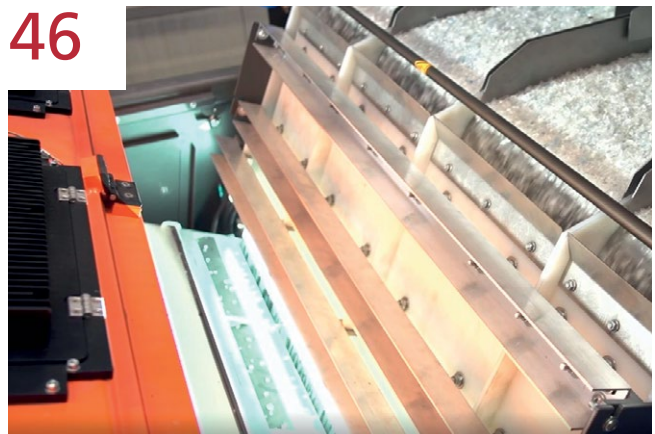
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Extrusion line operators have been experiencing a growing demand for customized mass production. Therefore, they are looking for ways to make them more cost-efficient. With a new upgrade for inline inspection system, PIXARGUS reduces the handling effort of quality inspection in corrugated tube production

Production of recycled plastic content is far from meeting demand, posing major industry challenges. Embracing the latest technological advancement in flake sorting helps bridge the gap between supply and demand and gives recyclers a competitive edge in efficiency and profitability



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PLAST 2023

05 - 08 September 2023
Milan / Italy
www.plastonline.org

SCHWEISSEN & SCHNEIDEN

11 - 15 September 2023
Essen / Germany
www.schweissen-schneiden.com

T-PLAS

20 - 23 September 2023
Bangkok / Thailand
www.tplas.com

Chemical Recycling Europe (CRE)

21 - 22 September 2023
Brussels / Belgium
www.polymercomplyeurope.eu

wire Southeast Asia Tube Southeast Asia

20 - 22 September 2023
Bangkok / Thailand
www.wire-southeastasia.com
www.tube-southeastasia.com

POWTECH

26 - 28 September, 2023
Nuremberg / Germany
www.powtech.de

Interplas

26 - 28 September 2023
Birmingham / UK
interplasuk.com

Central Asia Plast World

28 - 30 September 2023
Almaty / Kasachstan
www.k-globalgate.com/en/Global_Portfolio/Central_Asia_Plast_World/

Fakuma 2023

17 - 21 October 2023
Friedrichshafen / Germany
www.fakuma-messe.de

SPE Thermoforming Conference 2023

24 - 26 October 2023
Cleveland, Ohio / USA
<https://thermoformingdivision.com>

Central Asia Plast World

28 to 30 September 2023,
Almaty, Kasachstan

■ Messe Düsseldorf extends international portfolio for the plastics and rubber industry to include trade fair in Central Asia: Kazakhstan is the most economically developed country in Central Asia, its gross domestic product amounts to 193 billion US dollars. In the coming years the country is aiming for greater industrialisation and is currently experiencing high growth, for instance in the automotive industry. Imports of machinery and equipment as well as chemical products are booming. Therefore, plastics consumption is expected to increase by about 6% annually over the coming years.

The country's economic potential will be a benefit for exhibitors at Central Asia Plast World. The trade fair is being held by experienced local organiser Central Asia Trade Exhibitions for the 15th time

now, this year for the first time as a member of the Global Gate service brand. Messe Düsseldorf, which organises K, the world's leading trade fair for the plastics and rubber industry, bundles its worldwide business in this sector under this brand. Central Asia Plast World is the first platform of the Global Gate family in Central Asia.

With 65 exhibitors from 13 countries and 2,700 trade visitors, Central Asia Plast World is the most important business platform for plastics and rubber in Central Asia. Its range of products and services includes plant and machinery, raw and auxiliary materials, recycling as well as semi-finished products and technical parts.

► Messe Düsseldorf GmbH

Caroline Erben,

ErbenC@messe-duesseldorf.de

www.k-globalgate.com/en/Global_Portfolio/Central_Asia_Plast_World/

Fakuma 2023 – Highly Dynamic and Packed with Innovative Power

■ Expert visitors will gain an up-to-date, comprehensive overview of all processes, technologies and tools covering all aspects of plastics processing, in particular injection moulding, extrusion technology, thermoforming and 3D printing, at Fakuma from the 17th to 21st October, 2023. Halls A1 to A7 and B1 to B5, as well as the east and west foyer areas and the east concourse, will be occupied at the Friedrichshafen Exhibition Centre. "Roughly 4 months before the trade fair opens, we've already achieved very good booking levels," explains Annemarie Schur, Fakuma project manager from trade fair promoters P. E. Schall. "We're receiving additional bookings continuously – from abroad as well. In any case, we'll make optimum use of available floor space once again this year. The exhibi-

tion halls in Friedrichshafen will be packed, and everyone involved is looking forward to a lively and inspiring Fakuma 2023," says the project manager.

Lively participation and high levels of internationalism underscore Fakuma's significance as an outstanding technology and business event. Major issues addressed at this year's trade fair include, of course, circular economy, efficient use of resources and sustainability. The tasks currently faced by the industry are well known: reduced energy consumption, the digitalisation of production processes and the processing of recyclates into high-quality products. "You can clearly sense the needs which are currently driving the plastics industry," says Annemarie Schur. "Plastic products are designed for recycling right from the start. The issues of



recycling, environmental protection and sustainability are omnipresent, amongst the exhibitors as well. They're focusing on sustainable and efficient plastics manufacturing and processing."

"Fakuma is internationally recognised as a business platform for innovations throughout the value creation chain," observes Bettina Schall, trade fair promoter and managing director of P. E. Schall

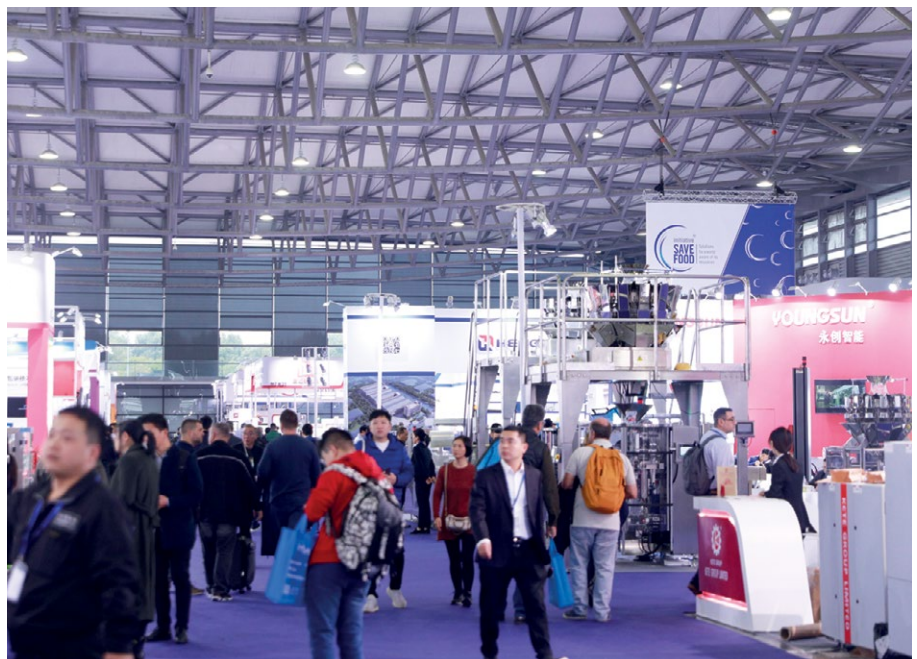
GmbH & Co. KG. "We cordially invite all industry players to visit Fakuma 2023 in Friedrichshafen. It's the ideal platform for discovering new products and technological solutions, as well as for personal and professional dialogue concerning present and future challenges," says the managing director of the trade fair promoters. Fakuma 2023, with its practice-oriented format and informal atmosphere, will be an essential milestone for finding solutions to the demanding tasks currently faced by the industry.

► P. E. Schall GmbH & Co. K
www.fakuma-messe.de

Going to China with the interpack alliance – swop is Ready for a Restart

■ The international trade fair business in China is ready to go, finally offering a platform for the processing and packaging industries in Shanghai again after a hiatus of three years. In November 2023, swop (Shanghai World of Packaging) will take place there with approximately 700 exhibitors.

After the end of the stringent restrictions due to COVID-19, the Chinese economy is on an upswing and industry actors from all over the globe are meeting again at trade fairs. swop 2023 is being held at just the right time to support the business of the processing and packaging industries, to move innovations to the fore and to promote international business relations. More than 700 exhibitors and 25.000 trade visitors, both domestic and international, attended the last swop in 2019. The expectations are similarly high for 2023; a total exhibition area of about 62,000 square metres is being planned. The trade fair will be held from 22 to 24 November at the Shanghai New International Expo Centre,



the third largest trade fair centre in China.

Together with Adsale Exhibition Services, Messe Düsseldorf Shanghai is hosting swop under the interpack alliance umbrella brand. Just like interpack, this trade fair addresses all core target groups from the sectors of food, beverages, confectionery and baked goods, pharmaceuticals, cos-

metics, non-foods and industrial goods. It covers the entire supply chain of the packaging industry. Its scope ranges from production and processing of packaging materials to primary and secondary packaging as well as packaging printing.

► interpack alliance
www.swop-online.com/en

interpack Delights the Global Processing and Packaging Industry



(Photo: VM Verlag, Bettina Jopp-Witt)

■ For those in the product packaging and processing business there was only one “place to be” from 4 to 10 May: interpack in Düsseldorf. Under the heading “Welcome Home” the trade fair welcomed visitors from all over the world. The joy of finally coming together as an industry was great.

It delivered what it promised and exceeded exhibitors’ expectations: the world’s largest and most relevant packaging trade fair set standards yet again, connected the industry on a global level and acted as both a marketplace and content hub. Visitors from 155 countries, many with firm intentions to buy, came to interpack 2023. 2,807 exhibitors showcased the power and creativity of the packaging industry with their technologies and solutions. What was easy to see were the numerous impulses, ideas and concrete business deals which will be implemented over the coming years.

At the end of the trade fair Bernd Jablonowski, Executive Di-

rector at Messe Düsseldorf, says: “With interpack we were able to finally hold one of the Messe Düsseldorf’s most important events again. It has reported back impressively and reinforced its position as the global platform for the exchange amongst all players in the packaging sector, related process industries and all user industries. Our targets were exceeded by far.”

Altogether approx. 143,000 visitors travelled to interpack in Düsseldorf, two thirds of them coming from abroad. Alongside many European countries, the largest visitor nations were India, Japan and the USA. Around 75% of visitors came from middle or top management.

“interpack at last!” was a phrase frequently heard in the halls – because after a six-year break the big community was finally able to meet again in person. And this was reflected in the joy on people’s faces. “interpack 2023 will reverberate with us for a long time – both in business and personal terms,”

says Director Thomas Dohse after seven trade fair days adding: “The mood in the halls was great and the inter-cultural exchange enriching for all sides. It was ‘simply unique’ again.”

This was underscored by the positive feedback from visitors, 96% of whom stated they had achieved their trade fair objectives. Just as satisfied were the exhibitors whose expectations had been exceeded many times over. “We thank Messe Düsseldorf for the outstanding organisation. I’m confident that I’m speaking on behalf of all companies here. interpack 2023 is simply a must for suppliers and users from all over the world to exchange experiences and do business,” says Markus Rustler, President of interpack 2023 at the conclusion of the event.

interpack’s strategic orientation towards the four Hot Topics: Circular Economy, Resource Management, Digital Technologies and Product Safety found concrete expression in numerous innovations. The trade fair, which has traditionally been a key cornerstone in the innovation cycle of the packaging industry and related process industries, also more than lived up to this claim this year.

components – which was held as a concurrent event with 80 exhibitors in a separate hall – also went down well with visitors. The upstream industries supplying components and software to packaging technology and process engineering play a prominent role in the digitalisation of manufacturing processes.

The next interpack will be held in Düsseldorf from 7 to 13 May 2026.

2022 Balance – Beyond All Expectation for Italian Manufacturers of Plastics and Rubber Processing Systems

■ The year-end figures for 2022 are official and the picture painted by the MECS Statistical Study Center, which published them, is a year worth framing: the plastics and rubber technology industry represented by Amaplast (Italian association of manufacturers of plastics and rubber processing machinery and moulds) closed the year with a turnover of 4.67 billion euros, the second-best performance ever. The variance with respect to 2021 is +5% and the December forecast (4.5 billion) proved to be somewhat cautious. And the balance among Amaplast members was even better (+9% turnover with respect to 2021).

The result is all the more satisfying if compared to the numerous difficulties confronting the industry over the course of the year – some of which are having continuing effects – between export limits to Russia, raw materials and component shortages, and skyrocketing energy costs.

The main driver of this historical result was exports, which showed a particularly positive trend towards the end of the year, with a total value again above the threshold of 3 billion euros.

After a most excellent 2021, the domestic market remained relatively stable, with a less pronounced increment of 0.8% and turnover of 2.54 billion euros.

In detail, exports by the Italian manufacturers – which continue to be the destination for 70% of production – show progressive growth



towards the three principal geographical destination zones:

- Europe (EU and extra EU): +8%
- Americas: +12%, thanks mainly to South America (+33% overall, with peaks mainly for Brazil and also, albeit with lower absolute values, for Colombia, Chile, and Peru). In North America, sales to the United States have slowed somewhat (-3%) while Mexico has recorded a strong new rebound (+35%)
- Asia: +9%. In the Far East (+9% on average), sales to India stand out at +24%, while China has retreated (-7%); in the Middle East (+11% overall) the driving forces are Saudi Arabia (+36%) and the Emirates (+58%).

Contradictory signals are arriving from the African continent, contrary to what was observed for 2021: exports to North Africa fell by 24% on average while those to sub-Saharan markets have increased by a similar proportion.

As regards export product categories, among machines for primary processing we observe robust growth in extruders (+23%) and mono-multifilament systems (+58%), the latter a category that has shown significant progression over the past three years, going from 74 million euros in 2020 to the historical peak of 140 million in 2022, after the previous decade with values ranging between 30 and 50 million euros.

On the other hand, injection moulding machines exhibit a relatively flat trend while blow-moulding systems and thermoforming machines have registered distinctly negative performance at -19% and -22%, respectively.

As regards the first quarter of 2023, the forecast based on an Amaplast member survey in early January highlighted the following expectations:

- +7% in orders (with respect to the same period in 2022). The outlook is positive, with substantially similar intensity, for both the Italian and foreign markets



- +6% in turnover, still significantly positive but slightly less stellar than revenues from the previous quarters. Sales abroad should once again be the principal source of satisfaction.

The outlook for the rest of 2023 remains uncertain, given the economic and political context that is still a bit up in the air. While the issue of energy costs and availability of raw materials and components has shown some partial improvement, troubles continue to be the order of the day – such as the recent bank crisis – and this makes any attempt to forecast the future quite challenging, to say the least.

Focusing on the German competitors, on the basis of the most recent surveys, at the end of 2022 they recorded a thirteen point drop in orders (the domestic market is particularly weak) coupled with a +10% in sales (sales abroad showing the principal positive signs). In this first glimpse of 2023, the gap between orders (-40%, with a collapse in domestic orders) and sales (+21% but here the best performance was observed at home) is only deepening.

For the Italian segment of the industry, 2023 is above all the year of PLAST, one of the world's premier fairs for the plastics and rubber industry organized by Promaplast srl. After a five-year hiatus, the fair will open its doors again on 5 to 8 September 2023 at the Fiera Milano Rho fairgrounds. Companies are getting ready to show the world the best of the Made-in-Italy in terms of design, materials, sustainability, and smart technology.

Measuring Technology Specialist Celebrates 50th Anniversary



■ SIKORA proudly looks back on its company history as it celebrates its 50th anniversary this year. Since 1973, the company has been developing and producing innovative measuring and control technology to increase its customers' productivity. Ideas, passion and a pioneering approach are the mainstays of the company's success.

The beginning

In 1972, Harald Sikora invented a non-contact measuring device for the continuous measurement of cable insulation, wall thickness and concentricity during manufacturing. This technology that later established itself as a global standard became the basis for a start-up. From the very beginning, the pursuit of perfection was part of the young electrical engineer's guiding principle: "There is nothing that cannot be done better. And that works best with clever ideas, passion and an ear for the customer." An attitude that characterizes SIKORA's culture through today.

On November 1, 1973, with the foundation of Harald Sikora's one-man business, the company's success story began, driven by a multitude of technological advances.

1990s– Growing product portfolio and internationalization

In the 90s, SIKORA added many more products to its portfolio. Among them were X-ray devices for measuring the wall thickness of three-layer medium, high and extra-

The first company building of today's SIKORA AG

high voltage cables during the cable production. These devices display the measuring results in fractions of a second and enable the operator to immediately make any needed adjustments. Even today, X-ray measuring devices from SIKORA are part of the industry standard for CV lines. Worldwide, approximately 1,800 devices are installed and ensure reliable quality control.

2000s – Further diversification

The success of the X-ray measuring system for CV lines was the basis for the development of an advanced, new series of X-ray measuring devices. They were designed for the measurement of wall thicknesses in core and sheathing lines, which was not previously possible. With the next generation of X-ray mea-



Katja Giersch, Head of Corporate Communications at SIKORA: "For the anniversary, SIKORA developed a logo that captures the spirit of the anniversary while combining pride in achievements and a forward-looking attitude. Three simple words sum up what SIKORA is celebrating: 50 years of groundbreaking ideas, the passion and commitment of the SIKORA team and the focus on a successful future."

asuring systems for the high-voltage cable production, SIKORA gained a market share of approximately 90 percent worldwide in the power cable segment. In 2000, the first subsidiary opened in the USA, followed by China and Italy. Over the next several years, numerous other international locations opened. This success was echoed in the 2002 decision to transform SIKORA INDUSTRIELEKTRONIK GMBH into the stock corporation SIKORA AG.

Since 2004, SIKORA has applied the experience gained in the cable industry to the hose, pipe and tube market. X-ray and laser technologies became standard here as well.

The company headquarters of SIKORA AG in Bremen





Harald Sikora, company founder and managing director of SIKORA HOLDING GmbH & Co. KG

In 2009, the entry into the glass fiber market with innovative measuring devices for quality control in the drawing tower began. In addition to the focus on quality, material efficiency and sustainability have become critical over the years. Economic in addition to ecological advantages gain importance in quality control.

2010s – Headquarters expansion and innovative technologies

The extended product portfolio and the increase in employees were influential in the 2011 decision to construct a new building for R&D and service at the headquarters. At the same time, in line with the succession plan, the company was di-

vided into two business segments: the SIKORA HOLDING GmbH & Co. KG and the SIKORA AG. For the first time, SIKORA launched a system for the inspection and sorting of plastic pellets, marking the entry into the plastics industry. In the tube, pipe and hose market, a millimeter wave-based measuring system for plastic pipes was introduced.

2020s – The present

Within 50 years, the one-man operation has grown into a globally active manufacturer and supplier of measurement, control and inspection technologies. The 350 employees in Bremen and the 15 international subsidiaries support customers worldwide with innovative solutions and service to increase productivity and for a sustainable future. "I am very proud and humbled by how the company has developed over the 50 years," says Harald Sikora. "Then as now, the secret of SIKORA's success is characterized by innovations that always keep the customer one step ahead in the market; our passion for the products and the consistent focus of all activities are on the customers."

20XX – Focus on the future

SIKORA does not reside in its past, but has ambitious future plans. "We look with pride at our past, at 50 years of measuring technology at SIKORA", says Dr. Christian Frank,



Dr. Christian Frank, CEO SIKORA AG

CEO at SIKORA. "The 50 years are an absolute success story written by our employees. I have great respect for this team achievement and am very proud to be a part of it. It is our claim to offer innovative solutions for our customers today and in the future. This includes further developments of existing products as well as new technologies that meet the diverse requirements of customers, such as in the areas of digitalization, circular economy and electrification. We also want to meet the demand for technical solutions for quality control from a single source and further develop our portfolio in this respect," says Frank.

➡ SIKORA AG
www.sikora.net

Certification Achieved

As part of a company-wide commitment to customer service and environmental sustainability, Davis-Standard's manufacturing facility in Fulton, N.Y., recently attained ISO 14001 certification. This certification validates processes across the board, internally and externally, and serves as a benchmark for Davis-Standard's ongoing pursuit of operational excellence, sustainable practices and process improvement. This is the third Davis-Standard facility to become ISO 14001 certified in addition to facilities in Finland and Switzerland. All of Davis-Standard's

global facilities are slated to become ISO 14001 certified by 2025.

"ISO 14001 certification directly aligns with our sustainability efforts concerning safety, quality and productivity to address customer needs while also strengthening internal practices," said Giovanni Spitale, Davis-Standard CEO. "Every aspect of our business at all Davis-Standard facilities must support industry-wide quality standards in order to fulfill the value proposition we offer customers. This includes focusing on equipment development and manufacturing efforts that reduce

waste, improve energy efficiency and recyclability."

At the core of ISO certification is the ability to consistently provide products and services that meet customer and applicable statutory and regulatory requirements. This is achieved by enhancing customer fulfillment through an effective quality management system (www.iso.org). All issues are addressed at the source to support best practices.

➡ Davis-Standard, LLC
www.davis-standard.com

Changing the Structure of Companies in the Nordic Countries

■ As of 1 May 2023, the Feddersen Group reorganised its business activities in the Nordic and Baltic countries. Previously bundled in K.D. Feddersen Norden AB, they now are transferred to legally independent structures in line with the business areas of the group of companies.

The former Forvema AB became K.D. Feddersen Distribution AB. The distribution business with engineering plastics for third-party brands is combined in this business unit. Managing Director of this new company is Dan Hagström, previously Marketing & Sales Manager of K.D. Feddersen Norden AB.

The machinery trade and services business area as well as the compound business of the group-owned AKRO-PLASTIC GmbH is covered by K.D. Feddersen Plastics Machinery AB. The previous managing director of K.D. Feddersen Norden AB, Torbjörn Egerhag, is managing director.

The Norwegian sister company Protec Scandinavia A/S, whose Managing Director is Per Skjevik, is renamed K.D. Feddersen Plastics Machinery A/S. At the same time, the business of the Swedish sister



company, Protec Scandinavia Sweden AB, is incorporated into K.D. Feddersen Plastics Machinery AB. A Finnish company for machinery trading is being established.

"The aim of this restructuring is to maintain a uniform appearance of the Feddersen Group under the brand K.D. Feddersen Distribution throughout Europe in order to increase synergies with the corresponding sister companies and to offer our customers an even

From left to right: Torbjörn Egerhag and Dan Hagström are looking forward to their new roles within the Feddersen Group

better service," says Volker Scheel, Managing Director of the parent company K.D. Feddersen Holding GmbH.

➔ Feddersen-Group
www.feddersen.group

Hot Analysis for Engineering Thermoplastics and Thermosets

■ Experts from the German Plastics Center (SKZ) and the Magnetic Resonance and X-ray Imaging (MRB) department of Fraunhofer IIS are investigating the use of high-temperature NMR up to 300 °C in a joint project. This should enable accelerated testing of engineering thermoplastics and thermosets.

The current project aims to demonstrate the feasibility of NMR measurements up to 300 °C and thus enable industry, especially SMEs, to improve quality control and thus gain a competitive advantage. In addition to engineering thermoplastics, thermosets will also be inves-

tigated in detail over the next two years and a material database will be compiled. By increasing the sample temperature to 300 °C, measurements on engineering thermoplastics such as PA, PC, PBT and PET will be possible. These have better thermal and mechanical properties than polyolefins and allow a significantly higher profit margin due to their higher price. Accordingly, the need for testing is also higher and the amortization of new measurement technology is possible more quickly.

In the future, the novel measurement and evaluation methods of high-temperature NMR will achieve



Schematic of the measurement principle (Photo: SKZ)

results comparable to those of established thermal analysis methods. The decisive advantages of the new high-temperature NMR compared

to previous methods include significantly shorter measurement times, the elimination of time-consuming sample preparation, and the possibility of investigating larger sample quantities in each individual measurement. Industry is expressly invited to participate in the project committee free of charge.

Laboratory analysis plays an important role in the production, processing and damage investigation of plastics. Due to their temperature-dependent material properties, differential scanning calorimetry (DSC) as well as rheological and (dynamic) mechanical tests at specific temperatures have become established as

standard methods. These test methods have the disadvantage that the samples must be elaborately prepared for the respective tests or only very small sample quantities (a few mg) can be investigated.

Nuclear magnetic resonance (NMR) offers an alternative for characterizing plastics. It is sensitive to the mobility of polymer chains and is good at detecting temperature-induced changes. Low-cost compact benchtop NMR instruments have become increasingly popular in recent years. They allow the investigation of plastic pellets (a few g) or thermoset molding compounds. However, due to the current use of temperature-

sensitive permanent magnets, measurement is only possible at room temperature or just above.

First commercially available approaches for measurement at higher temperatures allow sample temperatures up to 200 °C for measurements on polyolefins. However, since these material types allow only low profit margins, they are often not tested.

SKZ – Das Kunststoff-Zentrum
Dr. Norbert Halmen, n.halmen@skz.de

Fraunhofer IIS
Dr. Philipp Mörchel,
philipp.moerchel@iis.fraunhofer.de



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2

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max

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Significant Feedstock Agreements for Molecular Recycling Facility in France Secured

■ Eastman announced it has secured a significant amount of feedstock needed for its planned molecular recycling facility in Port Jerome sur Seine, Normandy, France. With an investment of \$1 billion, the planned facility will become the world's largest material-to-material molecular recycling plant.

"We began the year with roughly half of our feedstock needs secured for phase 1 of the project, and with these important additional agreements in place we are moving closer to the more than 80 percent we expect to secure by year-end," said Brad Lich, executive vice president and chief commercial officer. "This strong progress is a testament to the complementary nature of Eastman's innovative molecular recycling technology to the current mechanical technologies in the market and to the growing need to enable circularity for more waste streams going back to high-quality contact-sensitive output."

Citeo, the leading Producer Responsible Organization (PRO) in France, recently announced that Eastman, in a commercial partnership with Paprec, France's leading integrated waste management company, has been selected to receive a significant amount of feedstock for the methanolysis facility in Normandy. The Citeo agreement to secure French household waste has provided Eastman with a strong foundation for securing French-sourced waste for its project in France.

Eastman also shared it has reached an additional agreement with Interzero, an innovation leader in plastics recycling with the largest



sorting capacity in Europe, for an additional 25,000 metric tonnes of waste in addition to the 20,000 metric tonnes from a previous agreement announced last year.

Another agreement with a leading company in the waste management and recycling eco-system was reached at the end of last year. This agreement, adding approximately 30,000 metric tonnes of waste, allows geographic coverage in strategic waste supplies.

Eastman recently shared the decision to build the facility in two phases which will allow the facility to recycle over 200,000 metric tonnes of hard-to-recycle polyester waste annually, most of which is currently landfilled or incinerated today. Due to the updated plans, the company now expects phase 1 of the project to be mechanically complete in 2026 and process 100,000 metric tonnes.

Eastman will use its proven Polyester Renewal Technology (PRT) in France to recycle hard-to-recycle plastic waste that remains in a linear economy today. The company's

recycling technology allows this hard-to-recycle waste to be broken down into its molecular building blocks and then reassembled to become like new material without any compromise in quality and performance. Eastman's PRT enables the potentially infinite value of materials by keeping them in production, lifecycle after lifecycle. With the technology's highly efficient yield and the renewable energy sources available at the Normandy location, Eastman can transform waste plastic into like new food contact polyesters with lower greenhouse gas emissions than traditional methods.

In addition to this announced plant in France, Eastman is investing in two other molecular recycling plants in the U.S. - Kingsport, Tennessee, and another U.S. site to be announced later this year with an expected combined global investment of approximately \$2.25 billion for all three facilities.

 Eastman
www.eastman.com

www.smart-extrusion.com

Continuing on Course of Growth

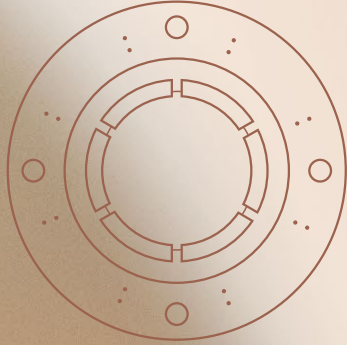
■ Around EUR 355 million in overall turnover, 350 extruders delivered creating an additional recycling capacity for 1.6 million tons of recycled pellets as a result - these are the impressive figures with which the EREMA Group was able to close the 2022/23 financial year in March. The innovations presented at K 2022 put the group of companies – consisting of EREMA Group GmbH and its subsidiaries EREMA, PURE LOOP, UMAC, 3S, KEYCYCLE and PLASMAC – in a strong position for their planned ongoing growth.

"With demand for recycled plastics remaining high, the past financial year brought many challenges that we needed to handle," says Manfred Hackl, CEO of EREMA Group GmbH. The challenges included persistent delays in the supply chain and unexpected supplier outages. Logistics and production processes had to be adapted several times as a result. The situation has improved significantly meantime as a result of these measures and more stable supply chains.

The production locations in Austria manufactured 270 extruders and delivered them to customers around the globe. Taking the whole group into consideration, this figure rises to 350 including the extruders from PLASMAC, the Italian subsidiary. The recycled pellet production capacity of all extrusion systems delivered in financial year 2022/23 adds up to around 1.6 million tonnes per year. On top of that there are around 130 additional components and modules such as filter systems and ReFresher anti-odour units.

K 2022 – the highlight trade fair of the past financial year – saw the EREMA Group launch seven new recycling systems and components. "For the first time, we brought all the companies in the group together on one stand, so we were able to provide an excellent overview of our wide range of products and services with the latest innovations as a one-stop-shop concept," says Manfred Hackl.

The beginning of the new financial year falls almost to the day on EREMA's 40th anniversary. On 14 April 1983, Helmut Bacher, Helmuth Schulz and Georg Wendelin founded EREMA Engineering Recycling Maschinen und Anlagen GesmbH, laying the foundation for the 40-year success story. During this period, the founders and their successors, together with the company's employees, have not only developed plastics recycling further, but have also made recycling possible in new applications, successfully making the journey from working out of a garage to becoming the world market leader.



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Record Year in 2022

■ The Board of Directors of Piovan S.p.A. approves the financial statements for the year 2022.

"Despite the complicated global scenario, once again our Group consolidates another year of growth, with revenues exceeding € 500 Million, a workforce of more than 1,800 employees and an Adjusted EBITDA up 53%. None of this would be possible if Piovan Group had not continued to set its strategy on its three historic fundamental pillars: CUSTOMERS, PEOPLE and INNOVATION. Never as in this year has the combination of these 3 elements produced excellent results in every field. But our strategy cannot disregard a fourth element that cuts across those mentioned above, which is the focus on SUSTAINABILITY," declares Nicola Piovan, Executive Chairman of Piovan S.p.A..

"The Company's choices of increasing focus on sustainability and circular economy have been financially rewarding and have led us to achieve important recognitions. First, with the improvement of our sustainability rating and the obtaining of the prestigious "Industry Top Rated" badge. Then, by the awarding of important orders in the circular economy, including automation for Asia's largest factory of NatureWorks - the world's largest producer of biopolymers. Thanks to the new technologies developed, revenues in the strategic circular economy segment are growing by



Filippo Zuppichin, CEO of Piovan S.p.A.

more than 20% on an organic basis, demonstrating once again how the Group is among the leaders in the industry," adds Filippo Zuppichin, CEO of Piovan S.p.A..

On a like-for-like basis, there was growth across all geographic areas, with substantial stability in the EMEA region. Including the results attributable to IPEG, performance improved further in all geographical areas, with North America becoming the reference market contributing 52.5% of total results, followed by EMEA (35.7%), Asia (8.5%) and South America (3.4%).

2022 and early 2023: In addition to the acquisition of IPEG, during 2022 the Group established a new company in China, Piovan Industrial Automation Co., LTD, in order to establish the Piovan Group's new plant in the country, which will also be the headquarters for all Group subsidiaries in the Asian region. The site will be dedicated to the design

and production of complete automation systems for the processing of plastics, food powders and refrigeration solutions.

In addition, through its subsidiary Pelletron, Inc. it won a major order from NatureWorks, the world's largest producer of biopolymers from renewable resources, for the automation of a new PLA plant in Thailand with a production capacity of 75,000 mt per year.

With a view to further geographical expansion, the Group established a new sales subsidiary in Indonesia – PT Piovan Technology Indonesia – on 6 January 2008 in order to provide local and increasingly direct service to customers in this country.

In addition, in the area of innovation, during the year the company entered into an agreement with the Italian Revenue Agency, known as the Patent Box, for tax relief on the direct use of its software, industrial patents and know-how, which are linked by a complementarity bond. This facilitation allows the partial detaxation of income from the direct use of the Company's intangible assets.

The Piovan Group is present in several geographic areas and in diversified sectors, which mitigates the risk associated with the current geopolitical crisis and allows us to look to the future positively. Resilient sectors such as medical and flexible packaging are expected to hold up, and automotive is expected to improve.



Nicola Piovan, Executive Chairman of Piovan S.p.A.

Range of TPE Solutions Expanded – Focus on the Circular Economy

■ KRAIBURG TPE is now distributing selected TPE solutions with ISCC PLUS certification. By means of mass balancing, compliance with various social and ecological standards benefiting both processors and end consumers is ensured in the course of an extensive review. Seamless traceability in the supply chain is ensured, including proof of origin for feedstock and materials. This certification is especially beneficial for TPE customers in the highly regulated consumer and medical sectors, since they do not have to initiate another approval process.

Both the demand and standards for more sustainable solutions in the plastics industry continue to grow. Manufacturing companies have identified various ways to provide customers with products that contribute to the expansion of the circular economy. In particular, TPE compounds containing recycled materials are increasingly being used in response to market demands. The adjustment is however challenging in certain areas because the compounds being used are subject to special regulations and legal provisions that currently exclude the use of recycled materials, for example. Extensive testing by manufacturers and processors is also required for certain raw materials before they can be ultimately processed. Thus switching materials to a more sustainable product component cannot be realized without considerable additional effort and costs in these cases. KRAIBURG TPE is addressing this with proven product solutions including ISCC PLUS certification (mass balance). This helps customers switch to more sustainable products, taking the next step towards a circular economy together.



KRAIBURG TPE is now offering proven thermoplastic elastomers with ISCC PLUS certification (mass balance) at its headquarters in Waldkraiburg (Image: © 2023 KRAIBURG TPE)

ISCC is a globally applicable, recognized, and standardized certification system that covers bio, bio-circular, and circular raw materials. Gradually increasing the proportion of more sustainable raw materials is possible with the help of the mass balance approach. Fossil raw materials are thus replaced and the CO₂e footprint is gradually reduced. This mass balance approach makes it possible to mix renewable and fossil raw materials in production processes. It ensures that the sustainable proportion of the mass balance is traceable. Another benefit for customers and processors is that so-called negative testing is not required thanks to the drop-in solution. Since customers receive a product that is chemically identical to their existing solutions, the current processing parameters remain unchanged.

➔ KRAIBURG TPE
www.kraiburg-tpe.com

Plastics Recycling Ambassador of the Year

■ Manfred Hackl, CEO of EREMA Group GmbH, was recently awarded the accolade Plastics Recycling Ambassador of the Year at the Plastics Recycling Show Europe. The award is given in honour of personalities who are particularly committed to plastics recycling.

Manfred Hackl has been with EREMA since 1995 and, prior to joining the management team, was responsible for the product development and market launch of VACUREMA technology that closed the loop in the bottle-to-bottle segment efficiently and cost effectively. In his current role as CEO of the EREMA Group and in various roles in well-known national and international associations he promotes plastics recycling and circular economy across the industry, regionally and throughout Europe - especially at EU level - encouraging everybody in the industry to work together.

"I dedicate the Recycling Ambassador of the Year award to the employees at the EREMA Group. This year we are celebrating our 40th anniversary, and this award,



Manfred Hackl,
CEO EREMA Group
GmbH (© EREMA)

just like the many we have received for our technologies over the years, shows that we can be very proud of what we have accomplished and achieved together during this time," says Manfred Hackl, delighted with the award.

➔ EREMA Group
www.erema.com

First Courses Held at the SKZ Training Center Quality

■ The German Plastics Center (SKZ) is pleased to announce the commissioning of the Training Center Quality (TZQ). The first course on "Practical assurance of color quality" was successfully held. The participants were pleased both with the opportunity to learn hands-on in the brand new laboratories and with a welcome gift.

At SKZ, the second brand new building officially starts operation shortly after the model factory. At TZQ, the focus is on continuing education. The rooms fill with life around continuing education on topics such as quality assurance and quality management in industry. The seminar rooms can be extended by flexible walls to include connectable practical laboratories. This has created contemporary places of learning. The variable concept and the extensive possibilities pursue the goal of maximizing learning success. For example, the high-quality equipment also enables online training and hands-on training for participants.

The proximity to the model factory and the large pilot plants makes it possible to view real production environments, experience new quality assurance methods live or even simulate an audit in a production environment.

"It was great to be able to access the new equipment and make the course even more practical. When you can put it directly into practice, learning content is simply better internalized. I look forward to preparing many colorists in the future with the possibilities of the TZQ in the best possible way for their tasks in everyday industry," says Linda Mittelberg, course instructor and group leader spectroscopy at the SKZ.

"The equipment will be further expanded in the coming weeks. Various measuring devices as well as a blown film line will further improve our options. For now, I'm



TZQ Director Christoph Kreutz (right) presents the first participants in the new premises with a welcome gift (Source: SKZ, Matthias Ruff)

happy to see that the building is filling with life," adds Christoph Kreutz, Group Manager Quality.

Colorist training is part of the future offering at TZQ. In addition, there will be a wide range of courses on quality assurance methods and quality management. SKZ classics, such as the "Plastics Quality Tester" course, which has been established in the industry for years, will be modernized by the possibilities offered by the TZQ, thus ensuring a sound knowledge of all aspects of quality.

Further information at:

► www.skz.de/bildung/kurse/prueftechnik-qualitaetsmanagement,
www.skz.de/bildung/colorist

New Melt Index Testers Save Time and Increase Repeatability

■ With the MFi5 and MFi7, Instron presents a new generation of melt index testers for a wide range of tasks, from monitoring incoming materials to product development and process control. The compact, manually operated MFi5 is ideal for fast and reliable measurements thanks to preset methods, while the modular MFi7 can be flexibly adapted to accommodate an increasing volume of testing. Both are suitable for test temperatures from 50 to 450 °C and are equipped with test weights from 0.1 to 21.6 kg. A piston travel transducer resolution of 0.005 mm and a piston displacement accuracy of up to 0.02 mm enable particularly accurate measurements. They thus cover the entire range of requirements for standard melt index tests in accordance with ISO 1133 and ASTM D1238, Methods A, B and C. Each System is operated via a 7" capacitive color touchscreen.

Optional equipment for MFi5 and MFi7 includes a motor-driven cutting device for precise, repeatable sep-



Instron's new MFi7 melt index tester during fast, software-assisted self-installation (© Instron)

aration of the extrudate by time (with 0.01 s accuracy) or position. Also optional are automatic automatic die plug opening, special pistons for high flow materials with very high MFR (1600 g/10 min and more), and the use of particularly corrosion- and wear-resistant steels for cylinders, pistons, and dies.

As an additional standard feature of the MFi7, a motorized lifting device handles the automatic, operator-independent application of test masses for more accurate, repeatable and reliable test results. An easily removable die retainer facilitates cleaning so that testing can be quickly resumed. An automatic material compaction system operates at constant pressure, also providing added accuracy and repeatability. Automated purging and cylinder cleaning allow effortless, rapid emptying of materials remaining in the cylinder after testing is complete. Load-cell controlled compaction and emptying phases avoid operator influences and can thus further boost laboratory efficiency and the consistency of test results. Time-consuming cleaning operations are eliminated at the end of each test. Options for the MFi7 include a manual mass selector for added operator safety and a safety cover that prevents unintentional access to the machine's test areas.

Three inputs via the user interface of the control panel are sufficient to create test methods quickly and easily. User permissions can be set up individually. Test results are displayed in the form of real-time graphs. Live help offered on each screen reduces the amount of training required for new operators, and it helps avoid costly errors during testing.

The MFi series is supported by Instron's Bluehill® Melt software. Equipped with easy-to-understand icons and workflows, it simplifies user training and test setup. Test methods can be deployed to any number of recipients, multiple measurement systems can be managed over a wired network, and reports can be generated, saved and exported automatically.

Application-specific optimal melt index measuring devices can be put together with the help of an online, interactive and intuitive configurator. Once the order is placed, Instron uses its smart inventory management and efficient production processes to realize short delivery times. In the test lab, videos then explain the measures for self-installation and immediate commissioning of the system.

To ensure productivity, reduce risk and minimize downtime, support teams are available around the clock to answer technical questions. A team of more than 300 service technicians helps Instron customers worldwide on-site to resolve issues. This is helped by the InSkill app as an AI-driven support tool that can be used, among other things, to submit support requests and view the calibration certificates and service history of the specific system.

ITW Test & Measurement Italia S.r.L.,
Instron CEAST Division
www.instron.com



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In-House Rheology Lab launched

■ Guill Tool, manufacturers of extrusion tooling for the global market, has opened an in-house rheology laboratory, making it the only extrusion tooling manufacturer in the industry with such a capability. Seeking to obtain better results and minimize the time it takes between testing and production, Guill built its own rheology lab in their facility in West Warwick, Rhode Island, USA. The lab features several key machines that ensure optimum results, when testing materials, especially new compounds to be extruded. The testing equipment includes a Hybrid Rotational Rheometer, a Differential Scanning Calorimeter, and a Thermal Conductivity Meter.

Third-party testing facilities are typically not experienced in extrusion processes. Guill, however, can not only gather data the same way third-party testers can, but can also interpret that data as it applies

New Guill Rheology Lab at company headquarters in West Warwick, Rhode Island



TA Instruments DSC-25 Differential Scanning Calorimeter

specifically to extrusion. Likewise, third-parties simply supply data, not recommendations. Guill is now equipped to both test its customer's materials and work with them to create extrusion tooling that will give them a competitive edge. Accurate simulation and interpretation by extrusion experts greatly reduces the number of physical reworks needed, as the tooling has a greater chance of producing a good product at the outset. In-house testing

TA Instruments DTC-300 Thermal Conductivity Meter



TA Instruments Discovery HR-2 Hybrid Rotational Rheometer

also speeds up the turnaround on test results, reducing delays during the tool design process and offering better control over the processes and test parameters.

The new Guill rheology lab processes standard materials, custom formulae and it is equipped to mix materials. These materials include plastics, thermoplastic elastomers, all types of rubber and silicone. Information from the lab is transmitted directly to the Guill engineering department via computer link for review by the design team.

The lab will be offered for use by extruders and chemical formulators, among others in the industry. Please contact Guill for full details.

➔ **Guill Tool & Engineering**
www.guill.com

Five Lines for Re-Compounding of Post-Consumer Plastic Waste

■ In the last 6 months ICMA has successfully completed four installations, with a fifth due to come shortly, of recycling lines dedicated to re-compounding of post-consumer plastic waste, all equipped with high-performance co-rotating twin-screw extruders model ICMA MCM 110 and MCM 140 High Torque.

Lines are installed in 3 different sites located in Europe and owned by major plastic processors.

All projects comprise the engineering and subsequent construction, installation and start-up of turn-key lines dedicated to the recycling of polyolefin, either polypropylene or polyethylene, with different density and pos-

sibility to add fillers and/or modifiers depending on the single set-up.

The selected extruders have enhanced degassing systems for efficient extraction of contaminants. The high torque of the extruders also provides an optimal filling of the screw and therefore a maximum production output in the range of 2 to 4 tons per hour depending on size of extruders, filtering tasks and type and/or density of the scrap.

Single systems of the line are generally integrated into ICMA's control panel, and all cabinets have remote control gates for efficient post-sale service.

All lines are equipped with gravimetric dosing systems and with forced feeders, in its latest design and when appropriate, for light scraps, notably difficult to feed into the extruder.

Thermoregulation system is highly precise and is made following the strict standards used in engineering compounds where also square design for barrels is a must in modern extruders.

Filtration systems, depending on the setup of the different lines delivered, can achieve 80 microns to guarantee maximum purity of the processed scrap with limited sacrifice for output range.

Underwater pelletizers are set at the end of each line, necessarily for big outputs.

“Sustainability and ESG policies are more and more driving processors to invest in advanced mechanical recycling,” says Giorgio Colombo, MD at ICMA, “our latest generation of co-rotating extruders combined with 50 years of experience as turn-key specialist in this field makes ICMA the partner of choice in this dynamic and challenging industry”.



ICMA's line with MCM 110 extruder during installation

ICMA SAN GIORGIO
www.icmasg.it

Fiber Thermoforming

■ KIEFEL presented its extensive portfolio of innovative and sustainable solutions for various industries at interpack 2023. Available just in time for this trade show: The new, advanced version of the NATUREFORMER KFT 90 with innovative functions to increase productivity.

The production of fiber-based packaging has reached new dimensions in terms of quality and efficiency thanks to the new advanced version of the NATUREFORMER KFT 90 which includes a range of innovative features that will increase the productivity.

With improved steam management, Kiefel Steam Flow Technology allows for up to a remarkable 30%



reduction in cycle time – meaning faster production and greater efficiency than before. In addition, its new temperature controller ensures

The NATUREFORMER KFT 90 can produce a variety of natural fiber packaging – from trays, cups to coffee capsules, containers for frozen food and more



The NATUREFORMER KFT 90 now upgraded for a 30% faster production. Advanced features also available for KFT 90 already installed as "Advance Upgrade" (Pictures © KIEFEL GmbH)

the highest possible process reliability and provides full control over every aspect of the operation. With an optimized HMI interface that simplifies machine operation, it's easier to get started producing high-quality parts right away, without warm-up phase. Furthermore, customers can expect higher profits due to an advanced molding process that reduces weight variation while increasing good parts.

KIEFEL GmbH
www.kiefel.com

Cost Efficiency in Melt Filtration

■ Recyclates of the highest quality are a highly sought-after commodity in the plastics processing industry. In line with demand, stricter requirements are also being placed on the productivity of the recycling systems. The high-performance melt filters from the ERF series from Ettlenger, the centre of competence for recycling in the MAAG Group, are a cost-effective solution for providing corresponding product quantities for the recyclable material cycle. The manufacturer's flagship is the powerful ERF 1000. When processing easy-flowing materials, its four rotating, perforated drums can filter up to ten tonnes of plastic melt per hour. The system's benefits include continuous operation in a stable process at consistent pressure and long operating times without filter changes. The very low melt loss in the range of a just few percent as well as the possibility of changing each drum individually and without interrupting production also contribute to the high cost efficiency of the ERF 1000.

If throughputs lower than those provided by the ERF 1000 are sufficient, the ERF 350 (up to more than 3,000 kg/h) and ERF 500 (up to 6,000 kg/h) offer alternatives to meet such requirements. All three sizes are designed for energy efficiency and are suitable for filtering common thermoplastics, including soft PVC. The proportion of contaminants such as paper, aluminium, wood, elastomers (rubber or silicone) or high-melting polymer composites can be up to 16%. ERF melt filters can in principle be used in any extrusion line – either single or twin-screw and irrespective of the type of pelletising system or other downstream unit. Thanks to their compactness,



Recycling of PE, PE-HD and PP are among the most common industrial applications of the ERF 1000 continuous melt filter, which can process up to 10 t/h, depending on the material involved (© Ettlenger)

they are also suitable for retrofitting existing extrusion lines. Typical applications range from recycling through to sheet and film extrusion and compounding. In film recycling in particular, the finest mesh size of 60 µm opens up possibilities for achieving benchmark qualities.

➔ Ettlenger Kunststoffmaschinen GmbH
www.maag.com

Back to CHINAPLAS

■ The main topics of the CHINAPLAS 2023 – Green, Smart, Advanced – fully reflect the Moretto philosophy and can be easily recognized in the several automations exposed.

Among Moretto's showed solutions:

- **X COMB**, the super compact mini dryer suitable for lower throughput of technical polymers. Fully electric (it does not require compressed air), it is specifically designed to efficiently treat hygroscopic technical polymers. A high-energy efficient product for demanding sectors such as medical, optical and electronics;
- **Mini Dryer XD TX**. By simply setting two parameters – polymer type and hourly throughput – the dryer automatically manage in a self-adaptive way the necessary airflow to treat the material;

- **Batch gravimetric dosing unit DGM Gravix** that ensures production flexibility and the highest dosing accuracy even in the presence of vibrations thanks to VIS (Vibration Immunity System) which allows it to be installed directly on the processing machine. Thanks to the Modbus, RS485, USB and Ethernet connections, it enables traceability of material consumption and recipe certification;

- **Compact loss-in-weight dosing unit DPK**, a Moretto exclusivity dedicated to micro-dosing which stands out for its high level of dosing precision. It is equipped – like the other range models – with a hopper made of transparent shock-proof acrylic material that makes the material content and loading



GRAVIX DGM 200

level immediately visible. The hopper is easily interchangeable without tools for quick recipe changes;

- **Dolphin automatic manifold**, one of the must-have of the



Dolphin

Moretto conveying systems which automatically feeds and sorts all the materials to every processing machines, avoiding any risk of contamination and human error. It is a

modular solution that can be easily configured according to customer needs;

- **One Wire Software**, a PLC-based server for the control of centralized conveying systems. An intelligent system that allows the user to remotely program and control the plastic transport system. It is simple to use and displays the status of the system immediately.

Moretto has been present in China, Shanghai, since 2017. A market at the core of the international plastics industry. The opening of the local branch responds to the need to be a reference point ever closer to the plastics transformers on site. The branch engages experienced staff able to offer qualified advice with a careful analysis of customer's requests and the proposal of timely and effective solutions. The on-site presence ensures a prompt and immediate after-sales service through direct presence on the market. A



X COMB Compact mini dryer fully electric Application

showroom is available for meeting with customers and training for sales and technical team.

Moretto S.p.A.
www.moretto.com

New Reconditioning Site in Poland Opened and Infinity Series Capabilities Expanded

■ Mauser Packaging Solutions, a global leader in solutions and services across the packaging life cycle, is expanding its reconditioning network and production capabilities for products that incorporate recycled plastic (PCR) in Poland through recent investments in state-of-the-art, automated equipment. These investments support the collection and supply of reconditioned Intermediate Bulk Containers (IBCs) and plastic drums in the region and further promote the circular economy through the expanded use of PCR.

"The investments in Gliwice, Poland, are another milestone for Mauser Packaging Solutions. We are proud to expand our reconditioning capabilities and Infinity Series production capacity in Europe. We strive to create a more sustainable future for our customers and with our new capabilities in Poland, we are taking a big step forward,"

supplemented Marcin Krzyszczo, Sales Director Poland.

Expanded capabilities at the Gliwice site will enable Mauser Packaging Solutions to offer reconditioning services for IBCs and plastic drums to customers in the region. Reconditioned packaging is available in a variety of specifications for both UN and non-UN applications. Reconditioning gives packaging a second life, diverting it from landfills and preserving natural resources. Through our complete solution Recover Syst-M, customers can easily schedule a pickup of empty IBCs and plastic drums from their facility or their customers.

Investments in a new multi-layer, plastic drum blow molding machine will help meet growing consumer demand for Mauser Packaging Solutions' Infinity Series product line. Infinity Series products are manufactured with high-quality, recycled

resin called Recolene®. Recolene® is manufactured in-house from suitable raw materials that have reached the end of their usable life and collected through Recover Syst-M. The new machine will be used to manufacture plastic drums ideal for use in a variety of industries. Use of recycled resin gives plastic materials a new life, reduces industrial waste, conserves raw materials, and decreases greenhouse gas emissions.

"In addition to reconditioning and expanded Infinity Series capabilities, the new production site allows us to offer our customers even greater security of supply, flexibility in order fulfillment, new product opportunities, and the chance to reduce their carbon footprints," said Lukasz Wesolowski, Plant Manager.

Mauser Packaging Solutions
www.mauserpackaging.com

At CHINAPLAS 2023, Extrusion Specialist showed how Sustainability, Automation and Digitalisation Increase Profitability in Film and Nonwovens Production

■ The Reifenhäuser Group presented itself at Chinaplas 2023 under the motto "The Time is Now" and showed how film and nonwovens producers master the three major topics of the industry: Sustainability, digitalization and productivity.

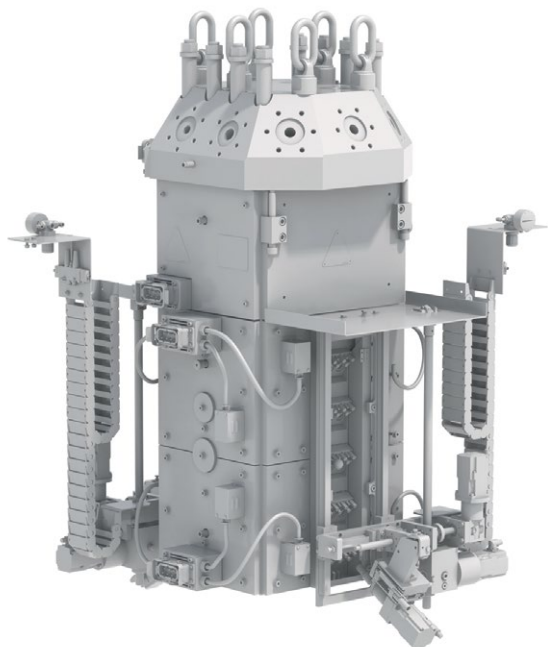
Reifenhäuser represented at the Shenzhen World Exhibition & Convention Center with three business units, "Blown Film", "Cast Sheet Coating" and "Reicofil", as well as its subsidiary Kdesign, which specializes in controlled air rings for blown film lines.

Production profitable blown film from simple recycle

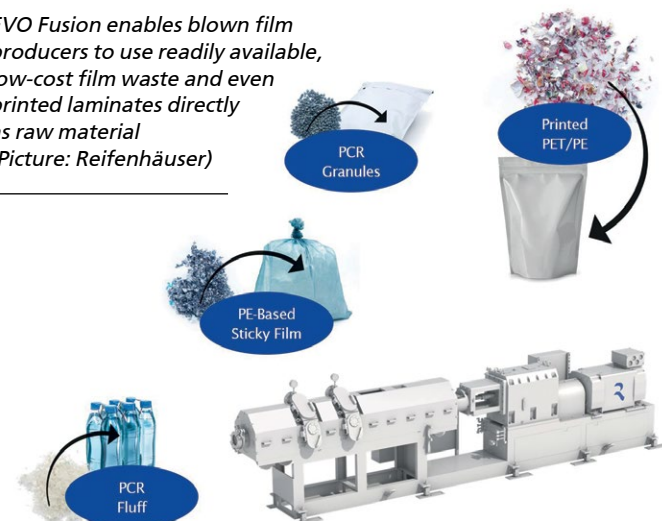
Blown film line manufacturer Reifenhäuser Blown Film presented its EVO Fusion technology as the answer to one of the biggest challenges facing film producers. Legal regulations and global brand owners are increasingly demanding that recycled material be used in films for packaging. A major problem here is sourcing recycle in good quality, sufficient quantity and at an economical price. As a result, the profit margin of film manufacturers decreases immensely. EVO Fusion enables blown film producers to become independent of expensive recycle and instead use readily available, low-cost film waste and even printed laminates directly as raw material.

The EVO Fusion process is based on direct extrusion, eliminating the need for expensive thermal recycling processes. This means that fluff (film snippets) and all types of production waste and PCR material can also be processed directly if desired. Direct extrusion is made possible by a twin-screw extruder, which homogenizes the

The coextrusion adapter with PAM option automates layer distribution adjustment and simplifies adaptations and optimizations by integrated recipe management (Picture: Reifenhäuser)



EVO Fusion enables blown film producers to use readily available, low-cost film waste and even printed laminates directly as raw material (Picture: Reifenhäuser)



melt better, ensuring a stable process. In addition, processors can degas the system very easily and effectively, removing unwanted components from the recycle.

PAM option: producing flat film highly flexibly with fully automated die and feedblock

Starting up a flat film extrusion line requires a lot of experience and time. A whole series of individual operations is necessary until the feedblock and die are set correctly. With the PAM option (Precise, Autonomous, Mechatronic), Reifenhäuser Cast Sheet Coating showed at Chinaplast how flat film producers can fully automate this adjustment, which used to be mostly manual. This enables faster start-up of good production and improved overall equipment efficiency (OEE). Scrap and material usage are significantly reduced. In addition, recipes that have been set once can be stored and recalled at any time. Film qualities can thus be reproduced exactly – even by inexperienced line operators.

At the heart of the PAM system are motorized screwdrivers that automatically and highly precisely profile the film layers on the coextrusion adapter and set and control the die flex lip. The PAM option is available exclusively for Reifenhäuser's Coextrusion Adapter Pro – the only coextrusion system on the market that allows profiling of the individual layers while the line is running. For flat dies, PAM is available as an optional feature for Reifenhäuser dies and also as a retrofit option for third-party systems.

Reicofil XHL (Extra High Loft) offers a new level of quality for nonwovens

The manufacturer of nonwoven lines Reifenhäuser Reicofil is presented its new RF5 XHL production platform for the first time in China. The suffix XHL stands for Extra High Loft. RF5 XHL is the evolution of the proven RF5 technology, targeted at super soft and drapeable nonwovens for the hygiene industry.



Kdesign's controlled air rings for blown film lines set performance benchmarks in terms of output and film quality (Picture: kDesign)

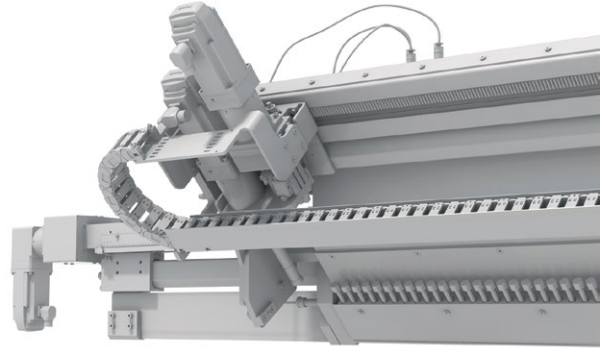
The RF5 XHL technology relies on the specially patented BiCo process. This combines two different raw materials in one fiber in the spunbond process, creating a bimetallic effect and optimally crimping the fiber. This results in a weight reduction of up to 25 percent for fiber sizes at 1.0 denier. At the same time, thickness increases by up to 30 percent compared to state-of-the-art material.

The new RF5 XHL lines are also equipped with particularly energy-efficient components, enabling resource-saving nonwoven production at high line speeds. To reduce production waste to a minimum, all raw materials are made of polypropylene (PP), for simple and efficient inline recycling. In contrast, common mixed-material fabrics made of PP/PE or PET/PE are very difficult to recycle. In addition, to meet the ongoing demand for more sustainable nonwoven products, RF5 lines also process bio-based raw materials on request.

Kdesign: World's best blown film technology at Chinaplas 2023

In addition to the Reifenhäuser business units, Kdesign – the world's leading supplier of controlled air rings – was also represented for the first time at the Reifenhäuser joint exhibition stand at Chinaplas this year. Kdesign has been part of the Reifenhäuser Group since the beginning of 2021 and presented how blown film lines with Kdesign components achieve more output, better film quality and less production waste. Special highlight: visitors to the booth had the possibility to try

RF5 XHL is the evolution of the proven RF5 platform, targeted at super soft and drapeable nonwovens for the hygiene industry (Picture: Reifenhäuser)



The motorized screwdrivers of the PAM option adjust and regulate the die flex lip automatically with high precision (Picture: Reifenhäuser)

out Kdesign's offline thickness measurement system "KDvision-Lab" on site.

Digitization sustainably increases overall equipment effectiveness

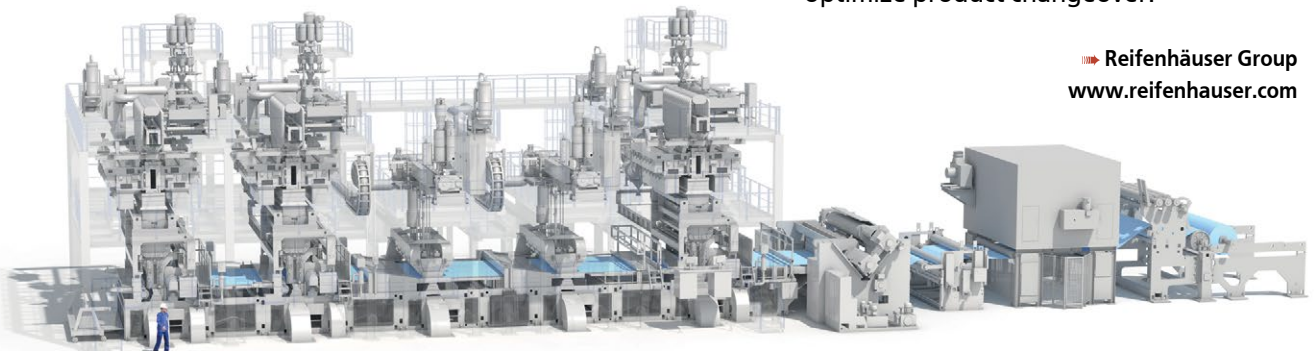
On top of this, Reifenhäuser launched a digital offensive at Chinaplas that aims to sustainably support plastics producers in optimizing their overall equipment effectiveness. RE: GmbH, the digital start-up of the Reifenhäuser Group, has developed a solution that connects the entire production from the first to the last meter of the film or nonwoven roll – cross-vendor.

The core of this digital solution is the powerful c.Hub Middleware and the ExtrusionOS Suite. At Chinaplas, RE: and Reifenhäuser showed customers how to keep an eye on their data in real time, analyze it, quickly troubleshoot, and ultimately optimize their processes.

And this is how Reifenhäuser's new digital solution works: the c.Hub Middleware connects, gathers and harmonizes data from ERP/MES systems and assets as well as peripherals of different ages, types and vendors. Thus, the c.Hub becomes the "single point of truth" for all data. Whether management, quality department, maintenance or operator, anyone can access the data, add contextual information, and draw useful conclusions at any time and from anywhere.

Customers can choose between ExtrusionOS bundles for different use cases, such as quality management, maintenance, or troubleshooting. These bundles include features such as product-specific alarms, EFSA/ FDA reporting, and helpful tools for operators, e.g., to optimize product changeover.

Reifenhäuser Group
www.reifenhäuser.com



Sustainability and Recycling for Woven Plastic Packaging

■ Starlinger showed its solutions for the sustainable use of plastic packaging at interpack 2023 in Düsseldorf/Germany.

"Closed loops for plastic packaging are not only a prerequisite for counteracting environmental pollution and constantly growing mountains of rubbish, but also to conserve resources," emphasized Angelika Huemer, Managing Partner of Starlinger & Co Ges.m.b.H. "Wherever such loops can be implemented in a sensible way, it should be done as quickly as possible. At Starlinger, we have been working on solutions to close the loop for woven plastic packaging for a number of years. Our concepts of using recycled PET or polypropylene in the manufacture of big bags and small woven bags are well received by the pioneers in the industry, and we will continue to work on them."

A pioneering project in this regard will soon be underway: Using Starlinger technology, big bag manufacturer LC Packaging, PET recycler PRT – a member of ALPLA Group, and Croatian recycler Velebit will jointly implement a closed loop for big bags made of polypropylene (PP) in autumn 2023. The big bags, which PRT uses for both the transport and storage of the input materials and the rPET granules produced from them, are recycled into rPP pellets by Velebit on a Starlinger recycling plant. LC Packaging mixes the recycled pellets with virgin material and produces tape fabric which is converted to rPP big bags.

The finished big bags are then supplied again to PRT.

In order to make polypropylene big bags, the most commonly used material for this type of packaging, more sustainable, Starlinger provides a pioneering solution for the packaging industry by processing recycled PP – also from post-consumer waste – on its production lines. "Starlinger customers are already producing big bags with recycled polypropylene. If the quality of the recycled material is good, high proportions of recycled content in this type of heavy-duty packaging, which has to fulfil special requirements, are no problem," said Huemer.

With the technology for manufacturing big bags from PET as an alternative to polypropylene, Starlinger is able to offer manufacturers in this packaging segment a solution for a completely closed packaging cycle. Properly recycled, rPET achieves properties like virgin resin and can be used up to 100% for the production of high-quality packaging – see bottle-to-bottle recycling. With Starlinger systems, it is now also possible to produce big bags from 100% recycled PET.

Starlinger not only offers production equipment for woven plastic packaging, but also systems for the recycling and refining of plastics, which are also used in the closed-loop solutions mentioned above. Starlinger recycling technology and Starlinger viscotec play a leading role in the industry with technolo-



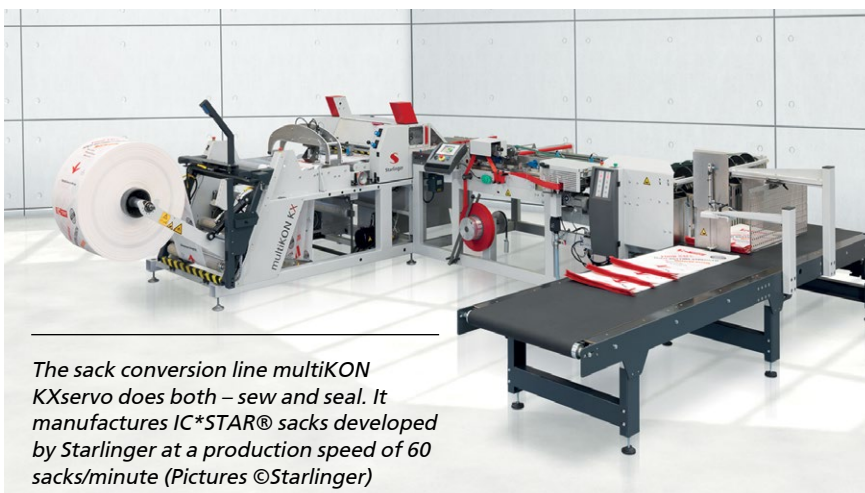
Starlinger technology makes it possible to produce big bags in a closed loop

gies for the production of food-grade PET and HDPE recyclates as well as thermoforming films made of rPET.

With the new recoSTAR PET art PET recycling system, Starlinger recycling technology offers an energy-saving and low-maintenance machine concept that produces food-grade rPET of the highest quality and at the same time reduces production costs by around 21%. In the field of post-consumer recycling, Starlinger's odor reduction technology helps ensure that packaging of consumer goods such as detergent and shampoo bottles can be recycled and reused in the same application, thus avoiding "downcycling".

With the viscoZERO melt-phase decontamination reactor, Starlinger viscotec has developed a versatile system that produces recycled PS, PP, PE or HDPE suitable for food packaging applications and increases the intrinsic viscosity of PET. Unwanted odours are also effectively removed during the decontamination process. The line processes production waste from fibre and textiles production, skeleton waste, strappings, or post-consumer plastic flakes.

The new Starlinger sack conversion line multiKON KXservo could be seen in operation at the booth and produced IC*STAR sacks devel-



*The sack conversion line multiKON KXservo does both – sew and seal. It manufactures IC*STAR® sacks developed by Starlinger at a production speed of 60 sacks/minute (Pictures ©Starlinger)*

oped by Starlinger. In the IC*STAR production process, the cut sacks run through a welding device in which a coated sealing strip is welded onto the bottom of the sack in a continuous process using hot air in order to close it. IC*STAR sacks are characterized by material saving production, excellent protection of the product, and high strength combined with low packaging weight.

The production software provider GRAFiT was also at the Starlinger stand during interpack. The Starlinger subsidiary offers software systems for the control and monitoring of production lines as well as product tracing which are installed also on Starlinger production lines, among others. Based on reliable information from the production line, the software provides a clear over-

view of all processes, enabling an objective analysis of the production process.

The Austrian platform "Packaging with a Future" was also presented at the Starlinger booth and provided information on circularity in the packaging industry.

► Starlinger & Co Ges.m.b.H.
www.starlinger.com

Note: IC*STAR® is a registered trademark. IC*STAR® sacks are produced exclusively on Starlinger machinery.

Circular Plastomers and Elastomers Based on Renewable Feedstock

Recent years have seen a steady increase in the demand for high-performance plastomers and elastomers that combine the physical properties of rubber with the processing advantages of a thermoplastic material. This trend has been accompanied by a growing urgency in the demand for sustainable solutions that offer the same material performance but with circular content and a reduced carbon footprint.

Borealis' production location in Geleen, the Netherlands, is the production site for Queo™, Borealis' range of high-performance polyolefin plastomers and elastomers. In March 2023, the facility received the International Sustainability and Carbon Certification (ISCC PLUS), thus enabling Borealis to introduce a new product line to meet customer demand for circular solutions: the Borneables™ line of Queo.

Produced with ISCC PLUS-certified renewable feedstock, the new line represents an expansion of the Borneables portfolio of circular polyolefin products, which offer the same material performance as fossil-based polyolefins, yet decoupled from fossil-based feedstock and with reduced carbon emissions.

Produced using proprietary Boreceed™ technology, Queo products bridge the performance gap between conventional plastics such as polyethylene (PE) and conventional elastomers like ethylene propylene



diene monomer (EPDM). Applications include automotive, flexible and rigid packaging, housewares, and wire and cables.

The Borneables line of Queo products is ISCC PLUS certified based on a mass balance approach, a chain of custody model that makes it possible to track, trace and verify sustainable content from feedback through to finished product. Borneables feedstock is derived solely from waste and residue streams: from vegetable oil products as well as oil waste and residues – for instance, used cooking oil.

The use of renewable feedstock is a key component of Borealis' Circular Cascade approach, which

illustrates how the company aims to lead the transformation of the plastics industry from linear to circular production.

The launch of circular plastomers and elastomers represents another step towards Borealis achieving its circular economy targets: by 2025, Borealis targets a four-fold increase in share of circular products and solutions to 600 kilotonnes per annum. By 2030, the volume of circular product and solutions is set to reach 1.8 million tonnes per annum globally, turning today's plastic waste into a valuable resource to be reused.

Borealis Group
www.borealisgroup.com

Leverage the 'Reduce – Reuse – Recycle – Replace' Approach to Advance the Plastics Circular Economy

■ Milliken & Company has the expertise and technology to help brand owners and converters achieve their sustainability objectives. Milliken's Chemical Business manufactures a range of packaging optimization solutions focused on enhancing clarity, reducing weight, utilizing mono-materials, improving recyclability, providing UV protection and ensuring food safety. The company draws from the 4 Rs (Reduce, Reuse, Recycle, Replace) to guide its sustainability efforts in the market, an emphasis that mirrors Milliken's overarching corporate sustainability goals.

"At Milliken, we see the impact sustainability can have on our communities now and in the future," says Cindy Boiter, president of Milliken's Chemical Business. "That's why we're dedicated to being a partner to the industry on this journey."

Milliken's technology-driven additive portfolio were on full display at Interpack 2023 in Düsseldorf this May.

"We aim to provide innovative solutions that help our customers achieve their sustainability objectives," adds Wim Van De Velde, Global Vice President, Plastic Additives for Milliken.

Milliken specializes in optimizing the performance of polypropylene (PP) and recycled polypropylene (rPP), helping to make durable, lightweight resins a viable alterna-

Millad® NX® 8000 ECO clarifying agent for polypropylene



DeltaMax® Performance modifiers for recycled polypropylene



Hyperform® HPN® performance additives for recycled polypropylene

tive to other, less-sustainable materials.

- DeltaMax® performance modifiers and DeltaFlow viscosity modifiers improve key aspects of PP impact copolymers and recycled PP. DeltaMax enhances the physical and flow properties of rPP, thereby enabling the use of more recycled content while also allowing converters to save energy. DeltaFlow, meanwhile, helps recyclers increase the melt flow rate of pre- and post-consumer rPP, thereby reducing energy use and advancing circularity.

- Hyperform® HPN® additives help maximize the stiffness of pre- and post-consumer rPP without sacrificing impact.

- Millad® NX® 8000 ECO clarifying agent helps produce the durable, fully transparent, highly recyclable material known as NX UltraClear™ PP.

Milliken's portfolio extends beyond polypropylene innovations. For example, UltraGuard™ Solutions increase barrier properties in polyethylene (PE), allowing converters to downgauge and enabling the use of more recyclable, mono-material PE package constructions.

Partnership & collaboration: Milliken's commitment to a sustain-

able future for the packaging industry is seen outside its product innovations as well. In addition to partnering with PureCycle, Milliken



UltraGuard™ Solutions for high-density polyethylene tubes (All photos © 2023 Milliken & Company)

participates in various industry initiatives, including:

- Achieving a Gold Rating on its 2022 EcoVadis sustainability assessment;

- Creating approved, science-based short- and long-term net-zero targets as informed by the U.N.-backed Science Based Targets Initiative (SBTI); and

- Participating in the HolyGrail 2.0 digital watermarks initiative to enhance recycling.

New Enhancements Help Processors Maximize Efficiency and Boost Screen Changer Performance

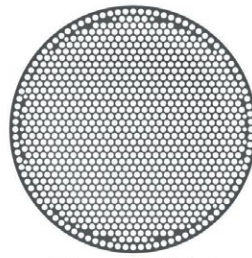
■ Faced with surging manufacturing demands, processors can employ a range of new options to boost productivity and enhance screen changer performance, according to PSI-Polymer Systems (PSI), a leading global supplier of high-performance gear pumps, screen changers, custom auxiliaries, and rebuilds for the polymer, adhesive, chemical, and food processing industries.

With heightened capacity demands and extended lead times for production equipment including extruders, processors are looking to maximize efficiency and dial-in certain enhancements to improve the overall manufacturing process, says Don Macnamara, general manager of PSI-Polymer Systems.

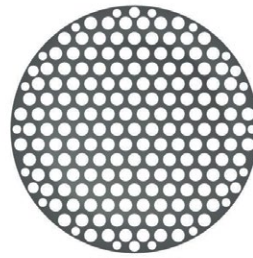
“Processors are using every available resource and thinking creatively to manage increased backlogs and retain customers,” said Macnamara. “To get more out of the process, there are a range of tried-and-tested enhancements that will give processors a leg up in meeting their day-to-day manufacturing demands.”

Processors can wring out greater efficiencies by using Super Plate, Oval Screen Pocket, and Low Delta P Breaker Plate options. Super Plates add efficiency and life to screen packs by allowing better utilization of the surface area. Doing so reduces screen replacement frequency and cost, according to the company.

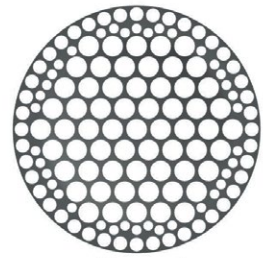
The gain is achieved by lifting the screen pack away from the flat, solid surface of the breaker plate. Conventional breaker plate open area is typ-



Class 2 (Std)



Class 3



Class 4

ically 50% to 55%. This means 45% to 50% of the screen rests on a solid surface. As a result, screen life diminishes rapidly as the small corresponding area over the breaker plate holes is blinded and the material must laterally traverse less clogged areas of the wire cloth to reach a through hole. This can be observed on spent screen packs as dense pockets of filtered contaminants over the breaker plate holes and lesser concentrations over the solid part of the breaker plate, according to PSI.

Use of a Super Plate fully exposes up to 95%+ of the screen to through-flow of the melt stream. This can yield a gain of 30 to 55% in effective filtration area over a conventional design.

The Super Plate is a precision-manufactured grid of stainless-steel diamond-shaped blades, cross welded to provide superior strength and support. The screen pack rests on the edge of the blades. Spacing and support of the blades often allows the cost-saving elimination of a 20-mesh or higher support screen. The Super Plate also eliminates the risk of screen blow-through and resulting contaminants in the end product that can occur if the delta-P exceeds the tensile strength of the

Breaker-Plate-Class 2-4

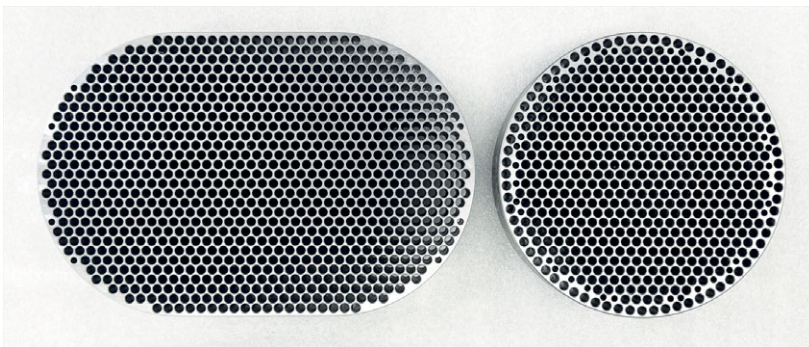
wire cloth sitting directly above a breaker plate hole.

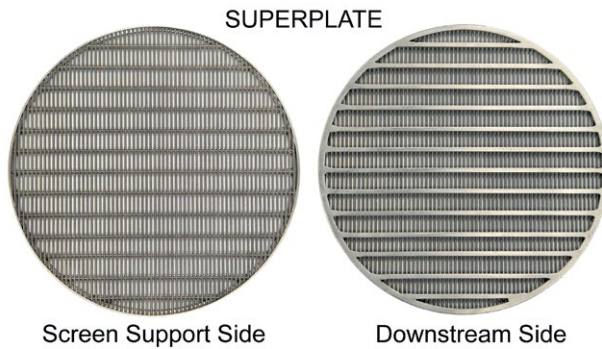
Meanwhile, Low Delta P Breaker plate design can significantly impact production run times between screen changes. Every process has a high-pressure limit defined either by the extruder or the yield strength of the screen pack. Starting (clean screen) pressure drop defines the low end of the process pressure window. Since screen micron rating and related wire diameters are generally standardized, when working with a defined filtration level, the remaining variable for reducing pressure drop is the diameter of the holes in the breaker plate.

Efficient breaker plate design balances open area and yield strength to minimize pressure drop. For most polymers and adhesives processed through screen changers, the industry standard (Class 2) breaker plate hole size works well. However, for high viscosity, fractional melt materials, the typical hole diameter generates a high-pressure drop. This reduces the pressure window and corresponding run time available for a given screen pack and results in more frequent screen changes, according to the company.

To reduce pressure-drop for these materials and add run time between screen changes, PSI offers Class 3 and Class 4 breaker plates, each having successively larger holes than the standard Class 2 plate. The Class 2 holes are ideally sized to support a 20-mesh screen. The larger diameter of the Class 3 and 4 holes use a Super Plate or a 10-mesh support screen for the finer filter screens.

Oval and standard breaker plate





These Class 3 and 4 breaker plates are available for CSC (continuous) and DSC (discontinuous) bolt-type screen changers and MSC (manual) slide plate screen changers.

When space and screen life are considerations, an oval screen pocket offers significant productivity advantages, according to the com-

Breaker-Plate-Class 2-4

pany. Available for bolt-type screen changers, the elongated pocket increases the filter area by roughly 168+%. This can be generally equivalent to upsizing the screen changer 1-1/2 to two times the model size

but with the space envelope of the smaller screen changer.

Pressure drop across the screen pack is lower, yielding higher throughput rates given the lower average back pressure. Shear stress is lower, boosting melt integrity.

Screen life is roughly linear to the area increase, yielding an increase in time between screen changes. For processes where recycle material can contain 'bursts' of contaminants, the longer screen life allows the operator longer intervals between screen maintenance. This option is only available for new machines due to the custom housing and bolts.

PSI-Polymer Systems Inc.
www.psi-polymersystems.com

New Application Development Laboratory in China Opened

Solvay has officially opened another application development lab (ADL) in Shanghai to expand the global footprint of its research and innovation capabilities. The opening ceremony of the new lab on May 12th was attended by Solvay's Chief Technology Officer Nicolas Cudré-Mauroux and Andrew Lau, Senior Executive Vice President of the company's Materials global business unit, and Francesco Triulzi, Head of Application Development Labs, Solvay Materials.

"There is an enormously growing demand for new application development in various Chinese key industries, such as automotive, life sciences and electronics," states Andrew Lau, and adds: "Our new ADL addresses this trend with a significant investment aimed at responding to local market needs faster and with greater proximity to customers than ever, providing tailored high-performance material solutions."

With a team of some 30 highly qualified and experienced scientists, engineers and technicians, the Shanghai ADL will be fully equipped to advance custom-tailored application developments using state-of-the-art Solvay technologies. An



Innovation Workshop will coordinate the resources to accelerate the implementation of local solutions through world class simulation, prototyping and performance evaluation services, complemented by various dedicated process equipment, such as for 3D printing, extrusion and noise-vibration-harshness (NHV) improvements.

"The new ADL will follow a triple strategy focusing on local-for-local, global-for-local and local-for-global innovation," explains Nicolas Cudré-Mauroux. "Unique facilities to support these efforts include a semi-

Solvay has opened an advanced Application Development Lab (ADL) in Shanghai, fully equipped to accelerate innovation in various Chinese key industries using the company's state-of-the-art material technologies (Photo: Solvay)

conductors clean room environment enabling high-purity and high-temperature testing, separation capabilities for hemodialysis and water filtration applications, and a functional and industrial coatings facility."

Solvay
www.solvay.com

Responding to Market Conditions in Pipe Extrusion

By Rich Guillemette, CEO, Guill Tool & Engineering

Guill is analyzing the latest market demands, combined with its extrusion die design expertise, to deliver solutions to its customers. Guill's new Spiderless Pipe Die is an alternative solution, utilizing precision tooling to provide material savings vs conventional Basket Dies.

The global market for pipes used in irrigation systems, sewage systems and industrial applications is expected to grow in the coming years. According to a report by MarketsandMarkets™, the global market for pipes is projected to reach USD 23.5 billion by 2025, growing at a CAGR of 6.1% from 2020 to 2025.

The demand for pipes is driven by the increasing need for water and wastewater infrastructure, as well as the growth in industrialization and urbanization. These factors are expected to drive demand for pipes in emerging economies such as China, India and Brazil, as well as in developed markets such as the United States and Europe. The U.S. government has announced several infrastructure improvement plans aimed at revitalizing the country's aging infrastructure, including its water and wastewater systems.

In March 2021, President Biden proposed the American Jobs Plan, a \$2 trillion infrastructure plan that includes funding for a wide range of infrastructure projects, including the modernization of water infrastructure. The plan proposes to invest \$111 billion in drinking water infrastructure, \$45 billion in reducing lead exposure in drinking water and \$56 billion in modernizing water infrastructure, including wastewater treatment plants and storm-water management systems.

What differentiates Guill's Spiderless Pipe Die design over a basket die is Guill's focus on precision tooling, developed from decades of experience in medical tubing, flow analysis and Guill's ISO 9001 and AS9100



(Aerospace) quality systems. The significance of Guill's Spiderless Pipe Die becomes clear when one considers material savings.

In general, the cost of the polymer raw material can range from 50% to 70% of the total cost of producing polymer pipes. The cost of other materials such as additives, fillers and reinforcements, as well as the cost of energy, labor, equipment and overhead also contribute to the total production cost.

In some cases, the cost of energy, particularly electricity and natural gas, can be a significant part of the total cost of production, especially for large-scale production facilities. In other cases, labor costs in regions with high labor costs, can significantly impact the cost of production. Also a factor is that the cost of the

raw polymer can be affected by market fluctuations in the price of oil, impacting the cost of petrochemicals used in the production of polymers. Additionally, the cost can also be influenced by supply and demand factors and global trade dynamics.

Guill's Spiderless Pipe Die is now available to meet the needs of its customers, as they consider all these factors required to be competitive in the production of pipes from 2" to 15" OD. This product was entirely conceived, designed, engineered, manufactured and CFD tested at the Guill factory in West Warwick, Rhode Island.

GUILL TOOL & ENGINEERING
Tom Baldock
West Warwick, Rhode Island, USA
www.guill.com

Innovation in the Sustainability Space – *Recycling Capacities in North America Expanded*

Recycling plastics in a way that is both economically successful and makes ecological sense is something that was hardly imaginable for many just a few years ago. The recycling machine manufacturer EREMA in Austria – like the sustainable packaging manufacturer Polykar in Canada – became a pioneer in its field through its early entry into plastics recycling. The two companies crossed paths in 2007 at the customer centre of EREMA North America (ENA) in Ipswich, MA, when Polykar founders Elyse Damjee and Aziz Karim expressed the desire to see an EREMA plant in operation and check out the recycled pellets it produced during a trial run.

"During this visit we were able to demonstrate the performance of our recycling machines and the excellent level of service we provide. That was the start of a partnership that is still going strong today," says ENA CEO Mike Horrocks.

Amir Karim, President and CEO of Polykar, took over the company, founded in 1987, and spent the last two decades turning his once garbage-bag family business into a sustainable-packaging powerhouse. The product range focus areas are: polyethylene film for converters, garbage bags, certified compostable bags and food and industrial flexible packaging. A circular approach to packaging has always been key for Polykar who continues to engage in partnerships with global polyethylene

New resin from plastic waste recycling



Post-commercial packaging being recycled with EREMA machine. (All images © Polykar)

suppliers and end users to recycle and reuse recycled packaging, giving the material a second life.

EREMA is a long-standing, reliable technology partner

Polykar began recycling post-industrial and post-commercial PE film following the purchase of their first EREMA T recycling system, which was commissioned one year after their visit to ENA. That was followed by an EREMA TVE system in 2011, and in 2014 the company was one of the world's first to use the new INTAREMA® TVEplus® recycling system with SWRTF melt filter, which had only recently been brought on to the market, making Polykar one of the most modern and efficient flexible film recycling plant operating in the province. That was the first generation of equipment that featured the newly developed and worldwide patented Counter Current technology. This innovative concept saw EREMA set a milestone in mechanical plastics recycling, because the optimised material feed from the cutter compactor into the tangentially aligned extruder enables it to take up more material in less time. Inside the cutter compactor, the material rotates in the opposite direction to the extruder, which means that the optimum temperature range of the material entering the extruder is much wider and the output rate is much higher. As a result, it provided the perfect technological support for the expansion of recycling capacity that Polykar was planning



Amir Karim, President and CEO Polykar

at the time, which moved to the next level in 2017. That is when the fourth recycling line went into operation in Montréal: A new INTAREMA® TVEplus® machine with Laser Filter. Together, these four machines, paired with the fact that Polykar also purchases post-industrial and post-commercial film scrap, currently produce more than 10,000 tons of recycled pellets per year.

Looking to the future with confidence

Polykar took its most recent step in growth in December 2022 with the opening of a new 50,000 square-foot state-of-the-art plant in Edmonton, Alberta. The new plant houses one of North America's most innovative centres of excellence for the development and marketing of flexible and compostable packaging.

Part of the modern line-up of machinery is an INTAREMA® 1310 TVEplus® machine with backflush filter. This recycles heavily printed LDPE production and industrial waste from blown film production. Annual capacity is 4,000 tons of recycled pellets. The company is therefore making a significant contribution to the Province of Alberta's efforts to keep plastic waste out of landfills by incorporating a cutting-edge recycling facility. It has also created 50 new jobs, with the number expected to grow to 70 within the next two years.

"Ever since we have focused specifically on plastics recycling, EREMA has been our innovative and reliable partner, offering top solutions for our requirements," explained Karim on why his company has kept on choosing recycling machines from the Austrian manufacturer every time it makes a new purchase. "The systems equipped with degassing and filters cope well with contamination from labels and adhesive tapes and produce high-quality recycled pellets. Recycling processes that work well are the basis for reusing more plastic waste and therefore less being sent to landfills. That is our goal."

The packaging manufacturer, which was named with the prestigious Canada's Best Managed Companies designation for its overall business performance and sustained growth since 2021 has a very positive outlook. "I see it as a huge opportunity to develop a whole slew of products that can be reused in the circular economy. Our team members can also bring in their flexible plastic waste from home to be recycled in-house. Introducing recycled content into some of our products is one of many examples of how we actively help advance the circular economy. It feels good to be involved in a business that is both economically successful and makes ecological sense," concluded Karim.

► EREMA Engineering Recycling Maschinen und Anlagen Ges.m.b.H.
Unterfeldstr. 3, 4052 Ansfelden, Austria
www.erema.com



Polykar's cutting-edge Edmonton plant

Hydraulic Alternative for Thick Edge Trims

Getecha presents a new guillotine for demanding coarse crushing

In film and plate extrusion, particularly tough edge trims come up every now and then, which cannot be deflected and can only be granulated to the desired target size at the level of the extrusion line. To condition this material for processing in hopper granulators as efficiently as possible, it must first run through the process step of coarse crushing. Adapted to this, GETECHA supplies a range of powerful foil cutters and choppers, which has now been extended by a new hydraulic guillotine for extreme process requirements.

The German plant engineering company GETECHA has developed a new hydraulic guillotine for the coarse crushing of extrusion waste, whose performance is designed for the processing of very solid, dimensionally stable and thick leftover pieces under low infeed speeds. It has the type designation GH 300 HYD and is the new top model in the chopper range of the company. With drive outputs of up to a total of 15 kilowatt, it is recommended as effective solution for particularly demanding tasks of coarse crushing, where continuous cutting

is not possible or electrically operated guillotines reach their limits. "The performance of the hydraulic unit of our new chopper is spread across 2 x 7.5 kilowatt for two cylinders, which provide the two blades of the system with particularly powerful feeds with torques of up to 200 kN. The GH 300 HYD reliably cuts through several centimetres of POM and HDPE residues from plate extrusion with this – depending on the application continuously and discontinuously with up to five scissor-cuts per minute", Christine Rosenberger, Managing Director of GETECHA explains. When coarse crushing such solid material strands, violent shocks and jamming of the material in the cooling off and trimming line must be avoided at all costs. For this reason, these hydraulic choppers are installed on linear guides. This way, the guillotine GH 300 HYD can operate as a floating installation during cutting at the feed level. This ensures smooth, continuous material flow, protects against shocks on the upstream extrusion equipment and enables realisation of customer-specific cutting lengths.

New from GETECHA: The hydraulic guillotine GH 300 HYD for the coarse crushing of very solid, dimensionally stable and tough edge trims from extrusion, which are difficult to deflect. The image shows the new coarse crusher mounted on a linear guide with adjustment unit (All photos: Getecha)

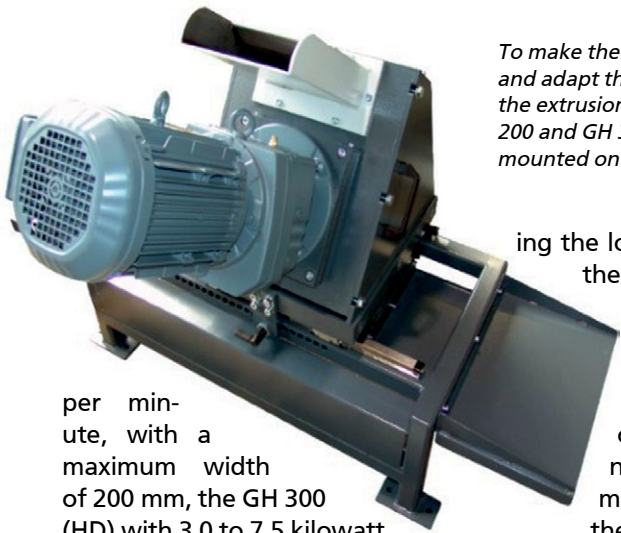


Christine Rosenberger (left): "Thanks to new design and hydraulic unit, our new guillotine GH 300 HYD achieves individual section lengths with up to five scissor-cuts per minute, even for several centimetre thick POM and HDPE edge trims from plate extrusion."

Three systems and many versions

With the hydraulic guillotine, GETECHA is extending its range of coarse crushers to now three chopper series in different performance classes. For the two electrically driven GH 200 and GH 300, as well as the new GH 300 HYD, it is vital that all important system parameters can always be designed project- and customer-specifically. All three guillotines share the feature of crushing in accordance with the scissor-cut principle, with one moveable and one fixed blade each. While for the small, compact GH 200, a 2.2 kilowatt drive (optionally also frequency-controlled) provides between 60 and 100 cuts





To make them easily accessible and safe and adapt them to the product width of the extrusion line, the guillotines of the GH 200 and GH 300 from GETECHA are often mounted on adjustment units

per minute, with a maximum width of 200 mm, the GH 300 (HD) with 3.0 to 7.5 kilowatt can carry out approx. 30 to 70 cuts/min., at widths of up to 300 mm. The standard version can already tackle material thicknesses of up to 20 mm. "All crushers of the GH series can always be customised to the specific demands of the user with regard to drive output as well as cutting angle and system configuration. The new hydraulic guillotine is no exception here", says Christine Rosenberger.

Quiet and efficient

In practice, the material strand intended for coarse crushing is usually deflected below the conveyor line behind the extrusion line follow-

The new GH 300 HYD from GETECHA behind an extrusion line with transversally discharging conveyor belt



ing the longitudinal cut, and fed to the hopper of the guillotine. Its moveable blade then quickly cuts the strand into the desired cutting lengths, which usually occurs without too much noise. The pre-granulated material then falls down from the system onto a discharge conveyor belt or a collection container. From here, it can be directly fed to a hopper granulator for further processing, where it is granulated to the desired target size. To make them easily accessible and safe and optimally adapt them to the width of the extrusion line, the guillotines of the GH series from GETECHA are usually mounted on an adjustment unit. For secondary grinding, the company's RotoSchneider series provides a large selection of hopper and infeed granulators in different sizes and performance classes.

Granulation of thin film residues

While the choppers from GETECHA are used for the coarse crushing of more or less thick material residues from plate extrusion, the large domain of the company's foil cutters is the granulation of thin edge trims and chips from plastic foil, paper, textiles, fleeces and similar thin materials. Here, the FS 200 as well as the FS 300 are designed for installation

in pipe systems, where they process the material fed at infeed speeds of up to 3,000 m/min. Typical for the FS series from GETECHA are an open rotor, rotor speeds which can be tailored to customer's needs (600 l/min up to 2,000 l/min) and a blade gap between rotor and stator blade of only 20 µm, which enables reliable granulation of even very thin edge trims. Depending on the application, the foil cutters can be equipped with two or four blade rotors, and operated project-related at operating air currents of up to 6,000 Bm³/h with or without screen.

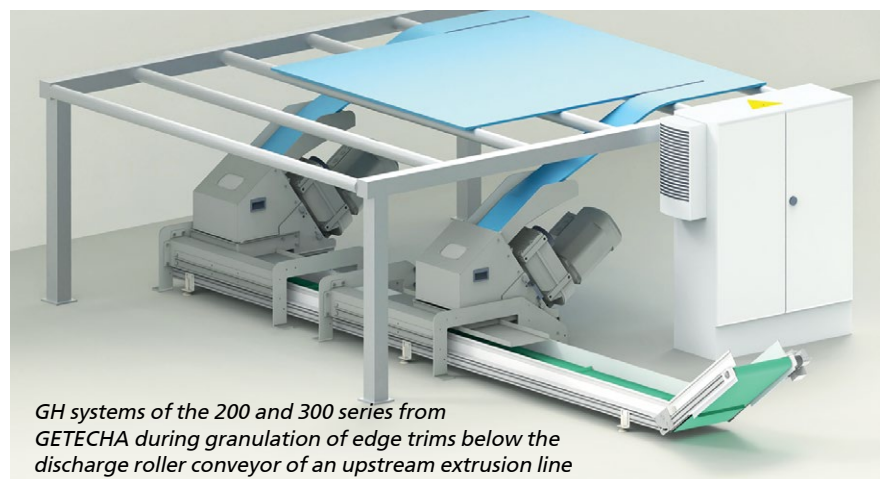
Intelligent and efficient

Just like its hopper and infeed granulators, GETECHA also equips its coarse crushing systems project- and customer-specifically with smart information and communication functions at Industry 4.0 level. With granulators from the RotoSchneider range, for example, thanks to state-of-the-art sensor and interface technology and the use of different fieldbus systems, all important machine data can be documented, processed and visualised. This improves monitoring, increases availability of the production line and provides an overview of the system's energy efficiency.

Author

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GH systems of the 200 and 300 series from GETECHA during granulation of edge trims below the discharge roller conveyor of an upstream extrusion line

Recycling of LDPE / LLDPE Film – *Guaranteed Quality Through Fine Filtration*

The transformation to a circular economy is being driven by the European Commission's „Europe 2020“ strategy for growth. The increase in recycling targets is encouraging European wide industrial symbioses which have set themselves the target of operating holistically and with more efficient use of resources.

One of these companies is the Spanish company, Llorens GMR in Barcelona. Llorens offers its customer an extensive service, from collection, preparation to the reuse of industrial waste. Llorens has several modern reprocessing and recycling lines.

Llorens has a relatively new extrusion line for reprocessing post-industrial waste film from LDPE and LLDPE, however the filtration fineness which could be achieved with the original equipment Melt Filtration was unable to remove the critical contaminants from the polymer. Llorens decided to add an RSFgenius Melt Filtration System from Gneuss as a fine filter in order to remove contaminants down to 56 to 100 µm. The Gneuss RSFgenius achieves this at a constant melt pressure, thereby ensuring that gels and black specks are reliably removed. As a result, Llorens is able to use the material produced on this line for high value cast and blown film applications. Llorens' customers can both fulfil the legal requirement for recycling content and manufacture high quality film.

The unique Gneuss Rotary Melt Filtration Systems can handle high melt pressures and heavily contami-



nated materials with highly variable contamination loads. At the same time, they operate process constant and with a high level of automation. Exchange of the filter elements takes place under normal production conditions, without disturbances in the process. Thanks to the highly efficient, automatic, segmental high pressure self-cleaning system, the RSFgenius Melt Filtration Systems from Gneuss offer long intervals between filter element changes with a minimum of back flushing material.

In recent years, throughout Europe (and worldwide) a large number of LDPE / LLDPE recycling extrusion lines have been retrofitted with Gneuss Melt Filtration Systems for fine filtration. Gneuss is specialised in individually retrofitting their equipment to existing extrusion lines and can offer complete retrofit packages consisting of a filtration system, melt pump, if necessary, and integrated control system to maintain the ease of operation of the overall systems.

RSFgenius Filtration System 330 for LDPE/LLDPE Film Recycling



➡ Gneuß Kunststofftechnik GmbH
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www.gneuss.com

Corona Treatment for a Better Extrusion Quality

One of Argentina's leading extruders of mono- and multi-layer PE films, Dinpe SA, has installed Vetaphone corona technology at its plant in San Juan, in the west of the Argentina Republic. The family owned and managed business, which was established in 1987, specializes in the co-extrusion and printing of PE film for bags, wraparound labels, and synthetic stoppers for wine bottles. The company has a modern production facility that includes 8-color printing presses, fabricators, and laminators for high-quality work that is meets ISO 9001:2015 standards. The end products are sold and marketed under the brand name Flexibles Plastinos.

It was the issue of quality that first led Dinpe to contact Vetaphone. German Gonzalez, the Plant Manager in San Juan explained: "We pride ourselves on the quality of work we supply to our customers and were having difficulty with this because of the poor reliability of the corona treaters fitted to our extruders." After meeting Carlos Sanchez of Conexsud, Vetaphone's representative in Argentina, and reviewing both the background of the Danish manufacturer and its support network as well as the technical performance of its technology, the decision was made to retrofit a Vetaphone corona treater to one of Dinpe's extruders.

The Vetaphone technology installed at the San Juan plant includes a VE2C-A (PF4-5) corona treater station of 2320mm width powered by an iCorona 2UL 10kW generator fitted with an iHP300 transformer. The system is controlled via Vetaphone's iCC7 operator panel, and the system is ventilated by an RD65UR blower fan.

"The result has more than met our expectations – it has way surpassed them, and we can now produce our coextruded polyolefin films with confidence that the quality will not vary. In fact, we are so impressed that our forward plan is to fit Vetaphone technology to all our other extruders," said Gonzalez. With the company's declared plans for an ambitious growth target, this will translate into good business for Vetaphone, as Ted Wolski, the company's Sales Manager for South America noted.



"It is always great to hear compliments like these and especially when it's a retrofit - this highlights the comparison between Vetaphone technology and that of other corona manufacturers and makes the case for production efficiency based on quality. We are delighted to hear that Dinpe has confidence in Vetaphone products and support, and much of this is down to Carlos and his team at Conexsud," said Wolski.

With its products used for various applications including soft drinks, beers, mineral water preserves and heat-shrinkable sleeves for pallets and demijohns, Dinpe has built up a diverse customer portfolio over the past 35 years. Its blown film extruders produce a range of shrinkable polyethylene films, classifying each type of film according to customer needs in a variety of widths, thicknesses, shrinkage conditions, in glass tone or color, and with or without printing.

The plant in San Juan, which covers some 3,000sqm, produces about 5,000 tons/year and employs around

Vetaphone's VE2C-A corona treater fitted to one of the blown-film extruders at Dinpe SA's production plant in San Juan, Argentina

60 people, uses only top-quality virgin raw material (generally low-density polyethylene), which, when subjected to a tubular blown extrusion process, produces films of optimum quality, gloss, transparency, resistance, and constant thickness.

As Gonzalez concluded: "We are very proud of our company and the work we produce here. Our business philosophy is based on satisfying all our customers' needs and adapting and growing our capacity to new requirements. We recognize our people as our greatest asset and invest time and money in training, teamwork, and self-management. If you add in the best technology, like Vetaphone, you have a recipe for success."

➔ Vetaphone A/S
Fabriksvej 11, 6000 Kolding, DK
www.vetaphone.com

Optimizing System Efficiency and Ecological Footprint

The past several decades have seen impressive refinements to gearboxes for industry and automobiles. Engineers have developed innovative approaches to problem-solving, such as transmission solutions optimized for specific tasks, greater integration of electronic submodules, new functionality, and the ability to network transmissions with other machine components. These changes are reflected in the IP as well. During the past ten years, several patents have been published that describe ways to reduce the ecological footprint of machines and vehicles.

New and refined transmissions are now expected to be more reliable, stay in service longer, take up less space, optimize weight and efficiency, and generally reduce costs in pursuit of lower energy consumption and lower harmful emissions. Terms like CO₂ reduction, decarbonization, and carbon footprint are now widely discussed. The increasing integration of peripherals and submodules into transmissions has resulted in more compact, lighter, and more reliable units. This article discusses how the use of commercially available, modular drive systems can avoid oversized mechanical, electrical, and electronic drive assemblies and optimize a system's CO₂ footprint, while simultaneously opening up new opportunities for manufacturers and operators of these machines and even facilitating innovative IoT business models.

Complete drive with high variability: "Extrusion line for medical cables"

To keep up with the expectations of modern medicine, cables used in medical systems must exhibit a range of special characteristics. These requirements influence not just the design, where space is always at a premium, but also hygienic and safety qualities. Innovative production methods and cutting-edge materials play large roles in fulfilling these elevated expectations. But what about the ecological footprint of such complex and technically demanding systems?

Extrusion lines for medical cables consist of one unwinding and one winding machine (constant output drives). These machines are characterized by a great deal of variability as a result of dynamic winding diameters and torques since winding machines have the



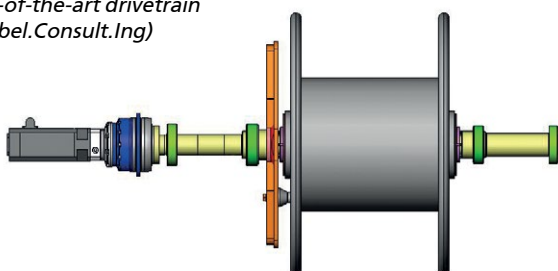
Extrusion line for demanding cables (©Kabel.Consult.Ing)

same torque characteristics as automobiles. The same is true for extruder drives (constant torque drive), whereby variability is due to inconsistent shear strengths and temperatures required to process the common plastics. The third highly variable drive is the positioning drive for layered winding of finished cable. In this case, the spool starts at its minimum, empty weight and finishes at its maximum, fully wound weight. It is also important to consider the moment of inertia ratio between the positioning machine and drive motor in order to ensure good regulation and control. This inevitably results in oversizing. The need for drives to produce high torque at start-up is another reason for oversizing.

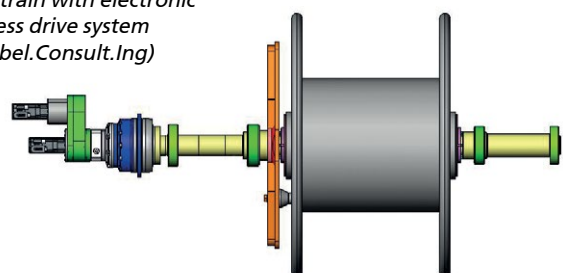
Mechanically stepless transmissions

A mechanically stepless transmission consists primarily of two pairs of cone pulleys installed on parallel shafts (driving and driven shafts) that can be displaced relative

State-of-the-art drivetrain
(©Kabel.Consult.Ing)



Drivetrain with electronic
stepless drive system
(©Kabel.Consult.Ing)





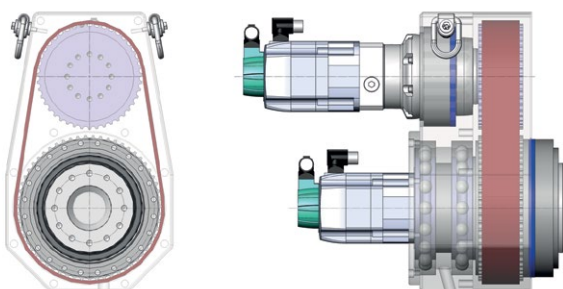
Lower ecological footprint (©iStock-ID:1305361225)

to each other. They are connected to each other by a rigid yet elastic chain or V-belt. The faces of the chain or V-belt transfer torque by engaging positively or frictionally into the cone pulleys in the radial direction. Each of the pulleys is arranged on its shaft to allow diagonal displacement. A mechanically, electrically, or hydraulically adjustable rocker permits infinite adjustment of the distances between the pairs of cones, causing displacement of the flexible chain or V-belt. This changes the effective transmission diameter of the pulley pairs and, as a result, the transmission ratio. A common bicycle *dérailleur* exemplifies mechanical adjustment of the transmission ratio with all of its benefits and drawbacks.

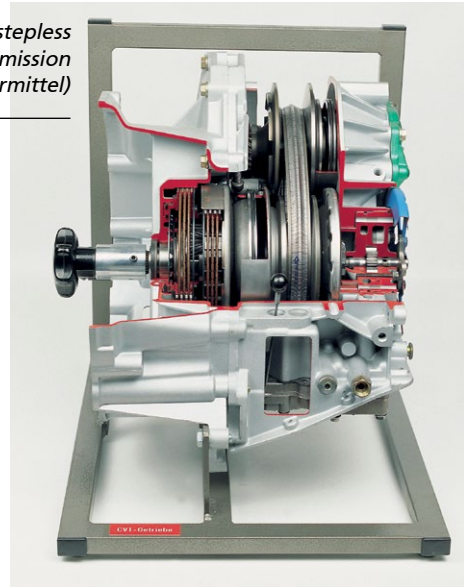
Electronic stepless drive system

A stepless drive consists of a planetary transmission, whose sun gear is driven by an electric motor, and ring gear, driven by a second electric motor, with output over the planet gear’s bearing. The electronic part of the drive system is characterized by a torque balancing system to provide a tight/slack connection without excessive tolerance, slippage, and vibration. Electronic adjustment of the transmission ratio is seen on high-speed winding systems in the cable and wire industry, in slow motion and as a speed- and diameter-adjustable process. In those cases, the cable or wire is the rigid but flexible element. In this way, all of the disadvantages of mechanically stepless transmissions known from the literature and in automobile forums are eliminated. The results: There is no need to produce high lateral forces; wear to the chain, cone pulley pairs, and axes is eliminated, since these are not present; and there is no rubber band effect during acceleration or shifting.

Electronic stepless drive system (©Kabel.Consult.Ing)



Mechanically stepless transmission (©Fa. Hako-Lehrmittel)



Optimizing a system's ecological footprint

As awareness of sustainability issues continues to expand, particularly in regards to climate protection, it is no wonder that industrial and manufacturing companies regularly assess the optimization potential of their systems. But where, specifically, can they make real progress?

An electronically stepless drive system is a good place to start and well suited for dynamic applications where a wide range of drive speeds and torques is required. Examples include winding machines; extruders; presses with high, low, and precision gears; conveyors with high, low, and idle gears; applications where high breakout torque is needed; and of course automobiles. Energy savings of more than 40% over conventional drive systems can be achieved. The potential is massive, comparable with that of shifting transmissions of the Industry 2.0 and 3.0 eras. Summary of benefits:

- Energy costs minimized with optimization of drive performance on motor-driven applications (like a winder or extruder);
- Optimization of generator output on generator-driven machines like unwinders;
- Standardization of drive components on individual machines or system; within a department; in a plant or company; or entire industries;
- Standardization of new services, products, and business models driving innovations in IoT for “networking and digital transformation in drive technology”;
- Valuable contributions to energy efficiency and conservation of resources (material and weight savings) and the larger shift away from fossil fuels to clean energy;
- Better than DIN EN 61800-9-2 with optimized gear ratios.

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ProfilControl 7 S CorrugatedTube

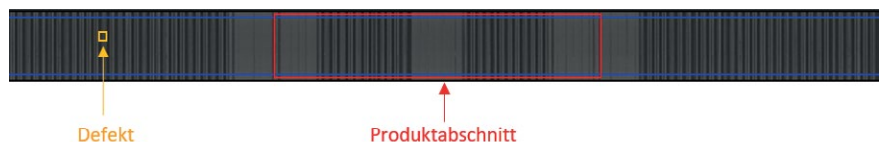
More Flexible Surface Inspection in Corrugated Tube Production

Extrusion line operators have been experiencing a growing demand for customized mass production. This means that they have to produce an increasingly growing number of product variants. Therefore, line operators are looking for ways to speed up their production processes and make them more cost-efficient. With a new upgrade for the ProfilControl 7 S CorrugatedTube inline inspection system, PIXARGUS reduces the handling effort of quality inspection in corrugated tube production. The magic word is "process-adapted quality control".

In corrugated tube extrusion, inspection systems not only have to deal with alternating sections of corrugated and plane structures. Certain tube sections may require other inspection modes. Or, the corrugator may engrave features into the extruded product that must not be detected as defects. For this, ProfilControl 7 S CorrugatedTube now offers special algorithms that take automation in quality inspection to a new level. "It is our aim to supply systems that ideally work without any setting up to be performed by the operator," says Jürgen Philipps, Managing Director and Head of Technological Development at PIXARGUS.

Software that adapts to different inspection tasks along corrugated tubes

In addition to their characteristic corrugations, corrugated tubing may consist of periodically recurring



sections with features that require special inspection. Automotive customers may order sets of different corrugated tubes, for example, for the assembly of engine blocks. It is possible to produce these sets of tubing in a corrugator line as a continuous product. A new algorithm of the inspection software now automatically recognizes where one of the sections within a set ends and the next one starts. If for one or several of the tube sections different inspection tasks apply, the algorithm

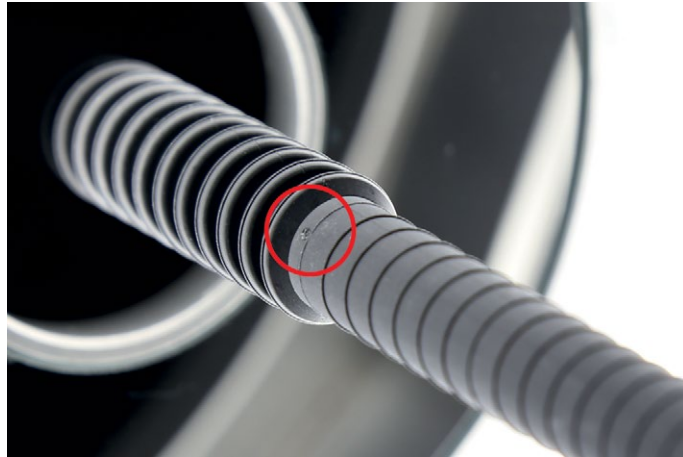
ProfilControl 7 S CorrugatedTube offers special algorithms to advance automation in quality inspection. The inspection system automatically recognizes different product sections and checks them for defects such as holes, dents, bubbles, etc. according to their individual inspection parameters

ensures that the correct inspection parameters are used in each individual case. This makes handling faster and simpler, even in case of a highly diversified product mix.

Surface inspection of corrugated tubes used to be extremely difficult terrain for quality control. Inspection systems have to deal not only with alternating sections of corrugated and plane structures, but also with tube sections that require different inspection modes. The new upgrade to the ProfilControl 7 CorrugatedTube software now accomplishes this challenging task automatically



Also extremely small flaws, like i.e. tiny dent in a protective tubing for electronic wiring in cars, may easily become safety-critical. ProfilControl 7 S CorrugatedTube guarantees 100% quality tubes for use in automotive engineering and many other demanding applications



Engraving Acceptance software distinguishes between desired and accidental markings

Corrugator dies can engrave symbols, numbers, letters and other markings into the product. To ensure that these engraved features are not detected as defects, the inspection system has to be able to recognize them as desired



engravings. Also for this task, the upgrade to the ProfilControl 7 S CorrugatedTube software includes a new algorithm that automatically recognizes and accepts these engravings as desired features. This makes for additional ease of handling for the operator.

ProfilControl 7 S CorrugatedTube – 100% defect recognition in corrugated tube production

With the PIXARGUS inline inspection system ProfilControl 7 S CorrugatedTube, it has now become possible for the very first time to inspect the entire wavy structure of corrugated tubing. The innovative sensor

unit is an advancement of the technology and design of PIXARGUS' proven PC7 S Tube inspection system. Eight high-performance cameras inspect the peaks, valleys and transition areas of the corrugated structure. In doing so, they can distinguish between unwanted and desired structures and features. Holes, dents, blisters, nodes, scratches or cracks are detected with 100 percent reliability. As a result, out-of-spec production of corrugated tubing – and the production costs – can be significantly reduced.

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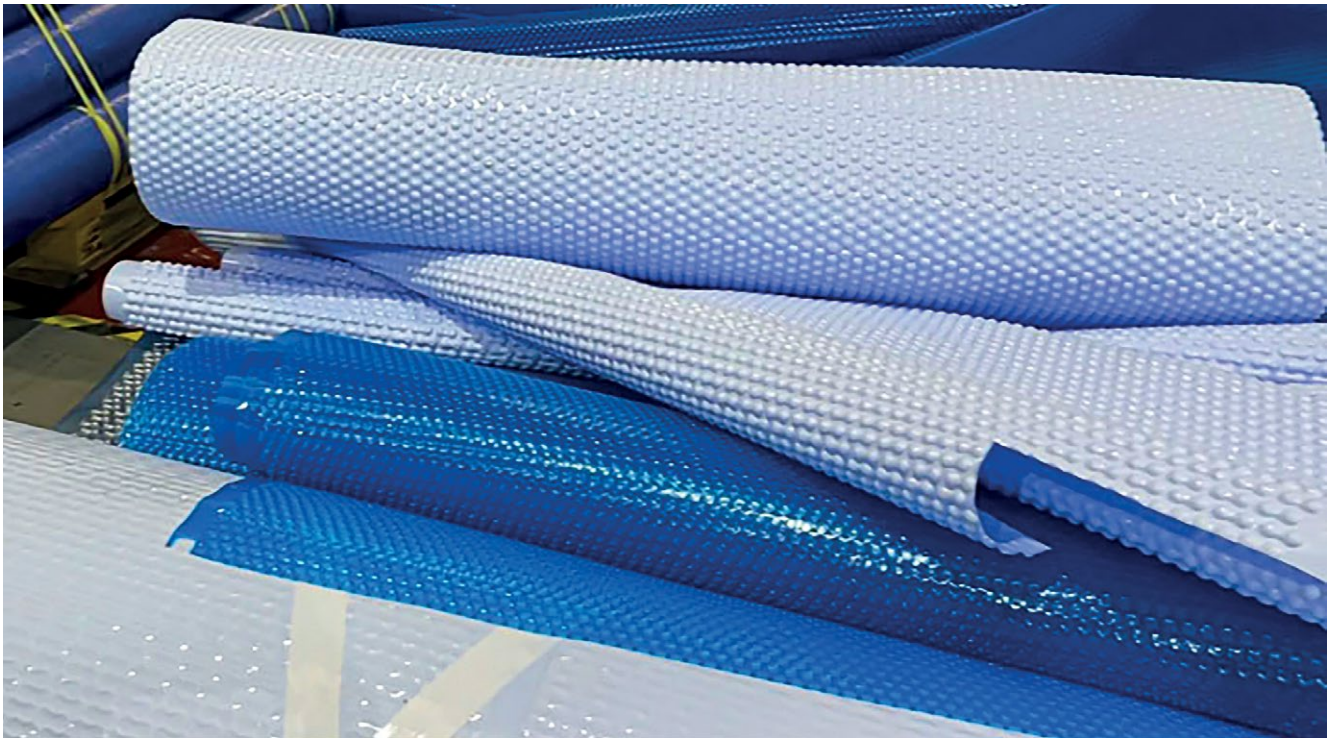
The inline inspection system ProfilControl 7 S CorrugatedTube reduces the handling effort of quality control in corrugated tube production. The magic word is "process-adapted quality control"

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„Got It Covered“

Any manufacturing and production process will no doubt produce waste in some form. So does Plastipack Limited in the UK, a producer of high-quality plastic swimming pool covers and water storage systems. By the help of a WEIMA two-stage size reduction system, plastic scrap is recycled directly on-site – for a closed loop.



It all started with an inquiry to the British WEIMA dealer Fer-cell from Aylesford in the county of Kent. Plastipack has already had positive experience with re-

cycling its own production waste for many years. In addition, there is an increased demand for pool foils. Consequently, the existing pelletizing system was to be

Production scrap from pool cover production at Plastipack Limited

renewed in order to further increase efficiency and throughput. After extensive material testing at Fer-cell's test center, the optimum configuration was finally worked out, with Plastipack opting for a two-stage processing solution consisting of a pre- and post-shredder including conveyor technology.

Where recycling begins: The shredding plant

Voluminous residual materials from production can be fed into the generously dimensioned hopper by



WEIMA WNZ granulator with sound insulation housing



Two-stage shredding for Plastipack with WEIMA shredders



Conveyor technology between the pre-shredding and post-shredding of WEIMA

forklift truck via special feed rollers. The WEIMA ZM 40 four-shaft shredder with a working width of approx. 760 mm first pre-shreds the film material to a homogeneous size. When changing the material, a built-in mechanism helps to ensure a particularly fast screen change. The screen is guided on rollers and can be pulled out horizontally from under the shredder. In the next step, the shredded plastics are transported by a conveyor belt to the WEIMA WNZ 310/800 granulator, which granulates them to a size of approx. 6 mm. In parallel, a drum magnet ensures that any last metal residues are safely removed.

Noise reduction during shredding and granulation

Another reason for using a shredder with four-shaft technology is its low noise level of only about 76 decibels. At around 25 rpm, the ZM shredder differs significantly from the WNZ secondary shredder, which rotates particularly fast at around 600 rpm and is correspondingly louder. To reduce the noise level of the WNZ as well, Fercell has completely enclosed the granulator in a soundproof box. It can be completely dismantled for maintenance purposes.

The recycling loop is closed

Finally, the film flakes are filled into big bags by means of a suction system and packed. Plastipack achieves a throughput of around 2,500 kg per hour. The regranulate is then used again in the actual production process of pool films.

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General view of the WEIMA recycling plant at Plastipack

Keeping Pace with High-quality Recycled Resin

Production of recycled plastic content is far from meeting demand, posing major industry challenges. Embracing the latest technological advancement in flake sorting helps bridge the gap between supply and demand and gives recyclers a competitive edge in efficiency and profitability.

The plastic industry is in transition and facing a set of challenges, the most prominent of which is delivering high-quality secondary feedstock in large enough volumes to meet the ever-growing demand. Over the last decades, plastic production rates shot up unprecedentedly. According to Plastics Europe, global plastic production reached 390.7 million metric tons in 2021 (including plastics production from polymerization and production of mechanically recycled plastics), of which 352.3 MT is virgin-based (90.2%) and only 32.5 MT (8.3%) from post-consumer recycled plastics. A closer look at the distribution of the total plastic production by type reveals that polyolefins make up the majority of it with manufacturing rates amounting to approximately 180.5 million MT. Although there is an affluence of plastic on the market and further increase expected, recycling rates remain low and access to high-quality recyclates is limited. In times when legislation and recycled content targets become increasingly stringent and time-sensitive, it is crucial to unlock the potential of existing solutions.

A glance at the current state of recycling shows that waste management infrastructures, from collection



Flake sorter purifying post-consumer plastics

to sorting and recycling, have become more mature in numerous countries around the world, but the capacities available are still not keeping pace with the ever-increasing demand for recycled resin. More investment is needed to establish solutions at scale, producing the volumes and qualities required. Fortunately, some bottlenecks can be overcome with sensor-based flake sorting solutions. As part of the recycling process, flake sorting narrows both the quality and quantity gap for polyolefins (PO), polyethylene terephthalate (PET) and a growing number of other applications. Recyclers using the latest flake sorting technology can capture more types of material, maximize yield and maintain profitable operations.

Flake sorters in recycling facility



Quantum leap in recyclates quality

Flake sorting is no stranger to plastic recycling. It allows for the creation of high-purity mono fractions of one material type and/or color and is the last purification step before the target fractions go into extrusion. Thus, it is an indispensable component of the recycling process and directly impacts the final quality and yield of the recyclates.

To date, flake sorters are already integrated into numerous bottle recycling plants around the world but hold much more potential. They can also be used for treating mixed plastic waste, unleashing new streams of available feedstock and improving recyclates quality. Often, where no advanced flake sorting solutions are



Mixed plastic waste



Sensor-based sorting accurately separates red and blue PP flakes

in place, the end product is a mix of different polymer types and, in some cases, numerous colors. Since this fraction contains several distinct product types, its quality levels are low and it can only be used for lower-grade applications, for which demand and value are marginal. The demand for superior secondary feedstock on the other hand is skyrocketing, spurred by stringent recycled content targets as well as the improvement of individual sustainability credentials. With advanced flake sorting, recyclers can easily upgrade their products and create new revenue streams.

High volumes of superior feedstock at hand

A plastic recycler can process more than 100,000 tonnes of polymer flakes per year, depending on market demand and material availability. With recent shortages of available materials, adaptability is key to maintaining profitable business. Waste streams and market demands are, in fact, highly dynamic. If the supply of recyclable polymers on the market is limited, but demand is high, plant operators often have little choice but to turn to more contaminated post-consumer waste to meet market demands. Exceptional purity requirements persist regardless of the volume to be processed and the type of recoverable feedstock, challenging recyclers to reach even higher qualities from increasingly more contaminated sources.

Compared to other processing machinery, flake sorters are a gateway to overcoming feedstock volatility. Compact in size, easy to install and flexible in operation, they prove to be a sound investment for small and large operations alike. Advanced flake sorting can process fluctuating levels of contamination without compromising recovery and purity levels. Equipped with a set of sophisticated technologies that are a fundamental part of the recycling process, they help turn low-quality input material into pure flakes that meet even the strictest quality requirements. This gives recyclers access to material that previously couldn't be recovered, squeezing out the maximum value from available fractions.

A good example of creating new revenue streams is the sorting of polyolefins. Holding the lion's share in global plastic production, the availability of PO on the market is abundant and offers a lot of potentials as the industry strives to use more recycled PO in the manufacture of high-quality products. Nevertheless, upgrading polyolefins presents its own set of challenges. Whereas PET bales processed in a recycling facility mostly consist of only one target material (PET), PO bales are a mix of two valuable materials: polyethylene (PE) and polypropylene (PP). The share of each material type in the PO infeed is hard to predict and can change with each bale. One bale could be a 50/50 mix of PE and PP, and the next could be a 70/30 mix. Irrespective of the input composition, both PE and PP flakes must be accurately identified and separated to create high-purity fractions for recycling.

Until advanced flake sorting and purification methods were introduced, the infrastructure lacked the technology to separate PP from PE cost-effectively. Less sophisticated flake sorters can solely purify one material type and remove only small amounts of contaminants, thereby often limiting their use to PET recycling plants. Furthermore, higher throughputs were hard or impossible to realize. For example, if a recycling plant uses less advanced flake sorters to process a PO bale composed of 60% HDPE and 40% PP (not considering other contaminants), the infeed would have to be sorted by belt-sorters before shredding, when the material size is big enough to allow for accurate separation of PE and PP. Consequently, shredding, washing and flake sorting would have to happen in parallel on two different lines, driving up costs significantly. With the aim to operate more profitably, recycling plants would prefer to process the material in batches on a single line. The downside of this approach is a reduction in total throughput. Moreover, it remains costly due to extensive material handling, such as re-baling, storage and manpower. These are some of the main challenges impeding the upgrading of PO to higher quality recyclates.

Modern sensor-based flake sorters are a game-changing technology for the industry in the above-mentioned



Easy to change configurations for maximum flexibility

scenario. They are capable of detecting and accurately sorting polyolefins by polymer type, as well as separating different colors, generating multiple fractions at the same time. With the integration of the most advanced flake sorting technologies in a recycling plant, materials can be shredded and washed in a single line before entering the flake sorting process. This, in turn, eliminates the need for multiple lines or batch processing. Embracing these solutions gives recyclers access to huge quantities of post-consumer materials to create high-purity fractions of rPE and rPP.

Flexibility for predictably higher yield

Infeed materials continue to become more complex. Depending on the respective contamination level and purity requirements, supplementary sorting steps are often required to purify the target fraction. Smaller operators with flake sorting installations can reap a lot of benefits from the system's capabilities and efficiencies. First, flake sorters can be easily integrated into existing plants because they require little space compared to other processing machinery, which makes them ideal for upgrading the sorting and purification capabilities of an existing recycling line. Second, it is possible to run multiple sorting steps within a single unit. This means operators can choose to balance throughput in favor of higher recovery rates and purity levels as needed. At the same time, smaller recycling companies can profit from the flexibility of processing a wider range of materials, thanks to the possibility of working in batches on a single unit. The scenario is different in high-volume plants, where operators can install multiple sorting machines in parallel or cascade setups to maximize throughput and qualities without increasing operation times. Regardless of the installation setup, flake sorters offer unrivaled flexibility, performance and generate reliable



flake qualities. Thus, the sorting results are predictable and so is the recycler's yield.

Blue skies ahead

Today, an extensive product portfolio of flake sorting solutions exists to meet both current and future demands. Plastic recyclers on the quest to source more materials or scale up their operations rely on best-in-class flake sorters. Whether PET, PP or PE, clear, blue, green or any opaque colored materials, today's advanced systems produce high-purity, mono-material and color-segregated fractions. Moreover, they withstand tough conditions, process large volumes and produce high-quality secondary feedstock. Flake sorting machines save space and reliably generate predictable results that lead to maximum yield. Their efficiency paired with the system's flexibility enable a rapid return on investment and give operators a competitive edge, now and in the long term.

The potential flake sorting holds is very promising and future-forward. When these technologies are integrated at scale and combined with modern extrusion and de-odorization processes, the future of plastics recycling will make an evolutionary change.

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