02/2026

VERLAG
Cologne /Germany

EXTRUSION INTERNATIONAL USA

Regular RECYCLING Section ..... p. 43

STEIN BLUE-LINE
for a sustainable future

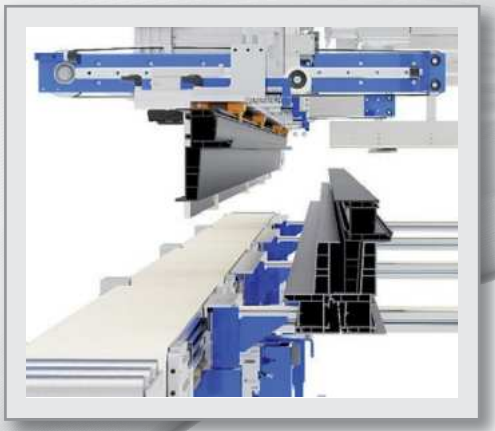
EXPERTS IN DOWNSTREAM

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 unusual profile geometries or special layer can be evaluated 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.

Made in Germany

STEIN BLUE-LINE
for a sustainable future

EQUIPMENT FOR EXTRUSION

Stein Profile Stacker

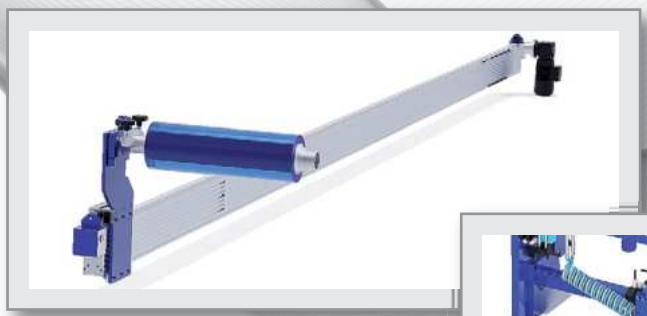
Weight determination during extrusion

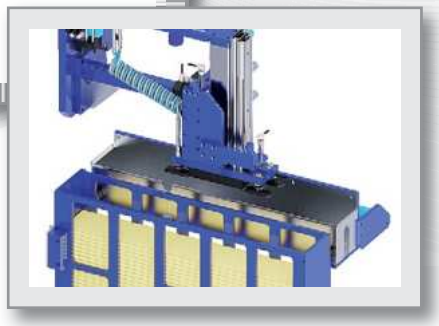
With the help of special weighing units, individual profiles can be weighed before a profile layer is formed.
The determined weight can be used to optimise the extrusion.

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

STEIN Maschinenbau GmbH & Co. KG

Wartbachstrasse 9
66999 Hinterweidenthal/Germany
Tel. (+49) (0)63 96-9215-0
Fax (+49) (0)63 96-9215-25
stein@stein-maschinenbau.de
www.stein-maschinenbau.de

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SBI Mechatronik (SBI), known for its comprehensive portfolio of inline thickness measurement devices, has expanded its product range with state-of-the-art image processing systems (WIS 1000), characterized by their flexibility and ability to adapt to individual customer requirements

30

Zumbach Electronic has recently unveiled its latest innovation in precision measurement technology: the QC non-contact, off-line measuring stations, designed to deliver fast, accurate, and repeatable measurements for wire, cable, and tube samples

31

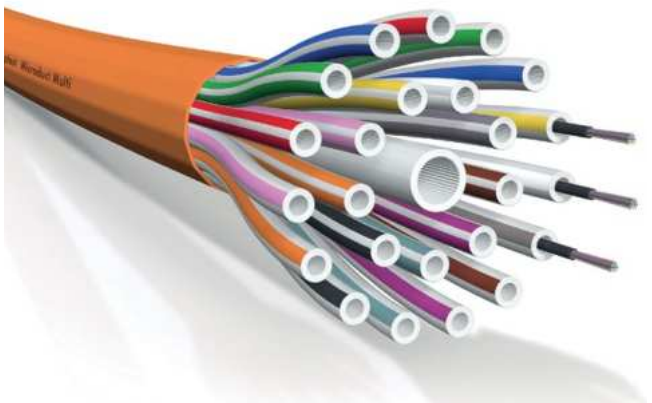
As an established market and technology leader in stretch wrap film lines, SML offers production lines for all types of stretch film application. One of SML's most successful lines, the MiniCast, will be shown in operation at the Plast 2026 trade show

32

Since 1985, CONEXTRU and its founder, J. Dobrowsky, have been involved in thecontinuous development of new pipe heads. This means that over 3,500 pipe heads designed and built during this period are currently in operation worldwide (Part 2 of his article)

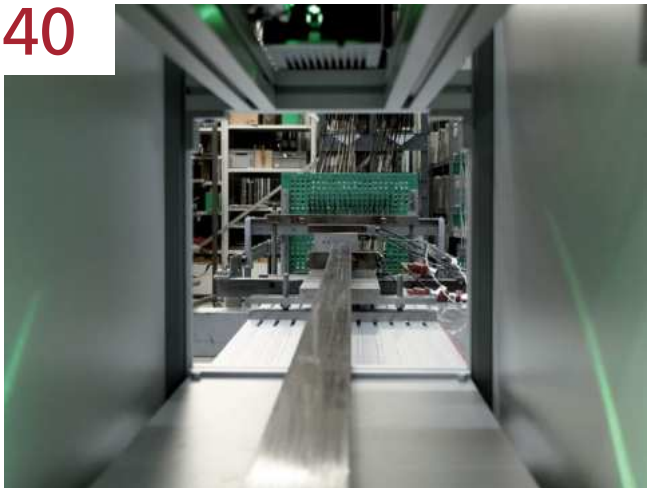
Around 2,000 metres of piping and a wealth of energy-efficient and smart technologies supply the extrusion lines at egeplast with plastic pellets for the production of microducts and bundle pipes for fibre-optic cable installation

36



A new measurement technology reduces scrap in fiber-reinforced plastic (FRP) profiles and enables cost-effective process control for small and mediumsized enterprises. Researchers developed the system in the PulLoop project led by the Fraunhofer AZOM

40



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

ADVERTISING SALES
Martina Lerner
T.+49 6226 971515
lerner-media@t-online.de

Tanja Bolta
t.bolta@vm-verlag.com
+49 15205626122

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

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

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

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

www.extrusion-global.com

Plastic Pipes Conference
12- 13 April 2026
Riyadh / Saudi Arabia
https://ppxxiii.com/

World of Cables
13 - 17 April 2026
Düsseldorf / Germany
www.wire.de/weltderkabel

CO_2-based Fuels and Chemicals
Conference 2026
28 - 29 April 2026
Cologne / Germany
https://co2-chemistry.eu/

Plastics Recycling Show Europe
05 - 06 May 2026
Amsterdam / The Netherlands
www.prseventeurope.com

interpack 2026
07 - 13 May 2026
Düsseldorf / Germany
www.interpack.de

Interplas 2026
02 - 04 June 2026
Birmingham / United Kingdom
www.interplasuk.com

Equiplast
02 – 05 June 2026
Barcelona / Spain
www.equiplast.com

PLAST Milan
9 – 12 June 2026
Milan / Italy
www.plastonline.org

SPE Extrusion Optimization
TopCon (Topical Conference)
16 - 18 June 2026
Quebec / Canada
http://speextrusiontopxon.technical-content.com

Future of Advanced Recycling 2026
17 – 18 June 2026
Pittsburgh, Pennsylvania / USA
www.wplgroup.com/aci/event/future-advanced-recycling-north-america/

Bettina Schall

Fakuma Story – *Plastics meet Personality*

It began as a vision conceived by Paul Eberhard Schall – the trade fair organiser with passion and a keen sense for emerging markets. Together with entrepreneur Eugen Hehl from family-owned ARBURG GmbH + Co KG, he established an event in the tri-border region at Lake Constance that would make economic history: Fakuma, a specialised trade fair for plastics processing.

Launched in 1981 with 76 exhibitors, it evolved into a major international trade fair at a breathtaking pace. What was so special about it. Specialised suppliers measure themselves against each other! At the same time they embrace a culture of exchange, competition and cooperation. This provides users with a comprehensive overview of the market. Driven by innovation and marketing strength, it radiates from Europe to the rest of the world.

"We're not just celebrating an anniversary on the occasion of the 30th Fakuma – we're celebrating a large, growing community: exhibitors, expert visitors, suppliers, booth builders, service companies, trade and daily press representatives, local partners in Friedrichshafen and logistics partners – they're all part of the Fakuma family," says Bettina Schall, managing director of P. E. Schall trade fair promoters, looking forward to the anniversary event.

To this day, Fakuma in Friedrichshafen has retained its special character based on personal interaction, as well as professional standards and staging. This is precisely the combination that fosters trust – and makes the trade fair a reliable basis for sound investment decisions.

The 30th Fakuma will cover the entire value chain in the field of plastics processing: injection moulding, forming and extrusion technology, 3D printing, masterbatches, raw materials, toolmaking and process technology, right on up to recycling. Whether materials, machines, peripherals or automation are involved.

P.E. Schall GmbH & Co. KG
www.schall-messen.de
www.fakuma-messe.de
FAKUMA 2026: 12 - 16 October 2026

New Consulting Service for Companies in the Plastics Industry Launched

The Plastics Center SKZ is expanding its service portfolio with a new, comprehensive consulting model for companies in the plastics industry. Companies can now sign a consulting agreement with SKZ to stay up to date on all relevant sustainability issues and to understand and implement regulatory developments at an early stage.

With this new offering, the Würzburg-based institute is establishing fixed and regular jour fixe appointments during which SKZ experts will classify current developments, highlight specific implications for companies, and address individual questions.

The focus is on sustainability reporting in accordance with CSRD/ESRS, with SKZ supporting companies in interpreting the requirements, deriving relevant KPIs, and setting up suitable reporting structures. The EU taxonomy is also part of the consulting service, particularly with regard to the evaluation and classification of economic activities.

In addition, the service includes classifications of new EU regulations and directives in the context of plastics and the environment – such as the EU Packaging Regulation (PPWR), the End-of-Life Vehicles Regulation, microplastics regulations, REACH requirements, and other circular economy requirements. This is supplemented by support with life cycle assessments (LCA), the calculation of carbon footprints, and the preparation of environmental product declarations (EPDs).

Other focal points include climate risk management, the legally compliant formulation of green environmental statements, the implementation of supply chain compliance requirements such as the Supply Chain Act or the Deforestation Regulation, and the requirements of the Ecodesign Regulation and the Digital Product Passport.

With the consulting contract, SKZ has created a format that goes beyond traditional training courses or individual projects. Companies benefit from ongoing technical support, early assessments of regulatory developments, and practical, directly implementable recommendations. Furthermore, participants gain access to a broad network of experts from research, testing, and industry. Another advantage is the transparency and planning security in a rapidly changing legal and market environment.

In addition to direct consulting services, contractors benefit from discounts on other SKZ sustainability services.

Dr. Hermann Achenbach, Head of Sustainability and Circular Economy at SKZ, is offering a new consulting service for the plastics industry together with a team of experts (Photo: Luca Hoffmannbeck, SKZ)

"With our new consulting model, we support companies in making informed sustainable decisions and reliably meeting regulatory requirements," explains Dr. Hermann Achenbach, Business Unit Manager Sustainability and Circular Economy at SKZ.

"The plastics industry is facing profound changes – and we offer the guidance and expertise that is needed now."

The Plastics Center SKZ
Dr. Hermann Achenbach
h.achenbach@skz.de

New Company Portfolio

TROESTER GmbH & Co. KG acquired the Turkish company SC OTOMASYON, based in Istanbul, in 2025. The company now operates under the name TROESTER Robotics and is integrated into the TROESTER Group structure.

Over the past years, the company has established itself as a reliable partner for leading international industrial companies and is known for high-quality automation solutions, innovative robotic systems and the successful implementation of complex production processes. Since launching its first major automated line for the tire industry in 2019, the company has delivered unique industrial automation solutions. Its technology is considered "proven technology": the applications have been running reliably for years and enjoy a high level customer satisfaction.

From left: Stephan Bartelt, Thomas Holzer, Isahan Köker, Ali Ekber, Emrah Sengül (© TROESTER)

This strategic investment strengthens TROESTER's positiion in automation and robotics solutions and creates additional synergies for future

growth. It also marks an important step in TROESTER's long-term strategy of developing autonomous production systems that enable fully integrated and low-labour manufacturing processes. Through this acquisition, TROESTER gains access to robotic applications across the entire tire factory – from individual process stations to fully networked production lines. Demand for robotic solutions is growing worldwide, as manufacturing companies in regions such as Europe, China and North America are increasingly affected by workforce shortages. With TROESTER Robotics, TROESTER is now able to meet this demand in the future with integrated solutions from a single source.

"The company brings start-up spirit, agility and strong innovative capabilities, while TROESTER contributes decades of experience, established commercial structures, a global sales network and long-standing customer relationships. Together, this creates a clear competitive advantage and a USP that sets us apart in the market," says Thomas Holzer, CEO of TROESTER GmbH & Co. KG.

The teams look forward to working together and jointly advancing technologically leading automation solutions.

TROESTER GmbH & Co. KG
TROESTER Robotics
www.troester.de

New Leadership for the VDMA Plastics and Rubber Machinery

At the meeting of the Executive Board of the VDMA Plastics and Rubber Machinery at March 5 in Osterburken/Germany two prominent figures who have shaped the committee for decades bid farewell: Ulrich Reifenhäuser, former CSO of Reifenhäuser GmbH & Co. KG, and Rainer Zimmermann, CEO of AZO GmbH & Co. KG.

Reifenhäuser was a member of the Executive Board for 32 years, 18 of which he served as its Chairman. Not only did he play a decisive role in shaping the associations's work, he also lived his roles as a board member, President of K-Show – the world's leading trade fair for the plastics industry – and entrepreneuer with deep conviction.

Thorsten Kühmann, Managing Director of VDMA Plastics and Rubber Machinery, sums it up: „Ulrich Reifenhäuser is a role model when it comes to being courageous in times of ever-changing geopolitical and economic challenges, actively shaping the future with confidence and working to ensure the sustainability oft he rubber and plastics machinery industry. His ability to bring people together has always advanced our common mission."

Sandra Füllsack, Managing Director of Motan Holding GmbH, will succeed him as the new Chair of the Board, while his younger brother, Bernd Reifenhäuser, CEO and Managing Partner of Reifenhäuser GmbH & Co. KG Maschinenfabrik, will join the Board.

The Executive Board of the VDMA Plastics and Rubber Machinery

Rainer Zimmermann, another longstanding member of the Executive Board, is also stepping down. For over two decades, Zimmermann stood for committed and reliable cooperation and was a clear voice for small and medium-sized enterpises. He is literally passing the baton to the next generation: his son Lukas Zimmermann, managing partner of AZO Holding, was also co-opted onto the Executive Board.

Kühmann expressed his sincere thanks to both: „Ulrich Reifenhäuser and Rainer Zimmermann have been and continue tob e committed companions who have influenced and helped shape the work oft he trade association with their commitment and ideas. With courage and foresight, they have accompanied our projects and set the agenda. Good association work needs this strong impetus from the industry in honorary positions. A heartfelt Thank You to both oft hem for these decades of tireless, excellent and constructive cooperation!"

VDMA e.V.
Plastics and Rubber Machinery
vdma.eu

Film Manufacturing Processes – Influence on Film Properties

6 May 2026, Online

This part is about flexible film production which has a significant influence on film properties. The maine processes, blown- and cast film production, are presented in detail. In particular, the influence of the processes on mechanical and optical properties as well as costs are discussed. Subsequently, stretching/orientation processes are presented, which bring further improvements of different properties. Typical examples are PP-BO, BOPE or PET-BO films, which are often used in laminates. In a final step technologies are discussed to enhance the barrier of polymer based films.

www.innoform-coaching.de

New Engineering Office

Kiefel is strengthening its process engineering as well as its technology and development expertise with a new engineering office in Heilbronn (Germany). The site has been operational since January 2026 and specifically expands Kiefel's global network of expertise with additional process engineering and application-oriented expertise.

The new five-strong team in Heilbronn has many years of experience in the thermoforming industry and comprehensive expertise in process and application engineering, tool and product design, as well as the design of machine, tools and material. The new employees are fully integrated into the Kiefel organization and work closely with the engineering and tooling teams in Freilassing and the Netherlands (Sprang-Capelle).

Sven Engelmann, Vice President – Technology: "The new team in Heilbronn specifically strengthens our process engineering and tooling expertise. Through close collaboration within the global Kiefel network, we can achieve shorter development paths and greater proximity to our customers."

Through cross-site networking, customers benefit from faster knowledge transfer, shorter development cycles and faster industrialization of new packaging solutions. The Heilbronn team supports projects from the early feasibility study phase to series production, thereby also strengthening Kiefel's customer-oriented development and sales support capacities.

Christoph Stoye, Site Manager – Process Engineering Heilbronn: "In Heilbronn, we are bringing together a highly experienced team that understands the entire process chain in thermoforming – from the product idea through tooling and process to series production. This team competency brings real added value to our development projects."

With the new engineering office in Heilbronn, Kiefel is underlining its ambition to operate worldwide as a technology leader and development partner for brand owners and converters – in both plastics and natural fiber processing.

Kiefel GmbH
www.kiefel.com

Pioneer of the First Hour Steps Down After More Than 30 Years Management

After more than three decades at the helm, founder and CEO Michael Carus stepped down as head of the Renewable Carbon division on 1 March 2026. Lars Börger as the new CEO, will take over this key position of the nova-Institute together with COO Linda Engel, while Carus will remain with the research and consulting company as a senior advisor and shareholder. This change takes place after a one-year transition phase, as planned.

This change in leadership marks a new chapter for nova-Institute: the transition from founder Michael Carus to his successor Lars Börger represents both continuity and a fresh start. The internationally renowned institute, a pioneer in the use of renewable carbon sources, will place an even stronger focus on practical research and consultancy projects intended to drive the industry's transition to climate-neutral materials and processes.

Michael Carus

Carus developed the nova-Institute from a start-up of six people into an internationally leading think tank for renewable carbon, employing around 50 scientists.

"Michael Carus laid the foundation for the success story of nova-Institute with his pioneering work. We are very grateful for his extraordinary commitment, foresight and responsible handover. We look forward to continuing to develop ideas together and putting our pioneering spirit into practice in the future," says Lars Börger, CEO of nova-Institute. "Industrial transformation is more urgent than ever today, and at the same time it represents a great opportunity. As an independent, science-based catalyst and thought leader, we will actively shape this change. Success requires a combination of strategic vision and detailed analysis of sustainability, technology, politics, the market and economic efficiency. That is exactly what nova stands for."

The nova-Institute has an interdisciplinary team of around 50 scientists who support international innovation projects and offer scientifically sound management and strategy consultancy. The team takes a holistic approach, analysing technologies

and raw materials in terms of their suitability, market potential, legal framework, sustainability and marketing opportunities. Based on these analyses, the team develops strategies for transitioning from fossil to renewable carbon.

"The nova-Institute's success story spans more than 30 years and stands for independent research and scientifically sound consultancy for a sustainable chemical and materials industry. With Lars Börger as CEO and Michael Carus as Senior Advisor, we are well placed for the future," says Linda Engel, COO of nova-Institute.

nova-Institut für politische und ökologische Innovation GmbH
www.nova-institute.eu

New State-of-the-Art European Operations Hub

CPM Crown, a global leader in process solutions and engineered equipment, will officially relocate its European operations to a new, state-of-the-art facility at a Citivale-managed site in April, marking a major milestone in the company's continued growth.

The move brings CPM Crown Europe together under one roof for the first time, creating a centralized hub designed to support collaboration and long-term expansion.

"Crown Europe has been based at our previous site since the 1990s, but our business has changed dramatically in recent years," said Chris Fisher, Director of Operations, EMEA at CPM Crown. "We've evolved from operating as individual geographic business units to becoming a centralized, global functional organization. With that shift has come growth – our team has nearly doubled – and we needed a space that enables the way we work today."

Previously spread across three aging buildings, the CPM Crown team will now operate from a single, modern facility designed to improve efficiency and integration.

"This new building also gives us the flexibility to grow in the future, including the potential to add a pilot plant where customers can see our innovations in action," Fisher added.

The newly refurbished space offers a blank canvas that is being thoughtfully designed to support collaboration. It blends open-plan office areas with dedicated rooms for meetings, training, customer engagement and product showcases – brought to life through CPM Crown branding and design elements that reflect the company's role as a global process solutions provider.

"Whenever I come to our European office, I'm really proud of the culture they've developed," said Alexander Danelich,

Global VP of Sales-Specialty Segment. "The new office will only make the cohesiveness of the team stronger, allowing them to operate as a full-service hub for the region and mirror nearly all the functions of our U.S. headquarters."

Citivale, the property management company behind the site, welcomed CPM Crown as the latest addition to a growing roster of leading regional and international businesses.

"Citivale has been brilliant to work with," Fisher said. "They're very accommodating, responsive and genuinely excited to have us join the community of businesses at the site. We've signed a 15-year lease with a clear view toward the future, which speaks volumes about our partnership."

CPM Holdings, Inc.
CPM Crown
Onecpm.com

Expansion – Custom Mould Capability with 16th Tool Commissioned

Glasgow based Nexus Packaging has commissioned its 16th custom mould since opening its manufacturing facility in 2024, reinforcing the company's commitment to delivering flexible, high-performance packaging solutions. A further eight bespoke tools are currently in development and will soon enter production. The continued investment reflects growing demand for tailored bottle designs across a range of industrial and chemical applications.

Nexus Packaging's all-electric blow moulding machines have been configured with multiple extrusion head spacings and mould mounting arrangements, enabling the business to accommodate a broad spectrum of custom mould requirements. This configuration allows the company to respond efficiently to new product launches and evolving customer specifications.

Supporting this capability are advanced four-chamber material blenders, which allow the precise mixing of virgin polymer, regrind, custom pigments and post-consumer recycled (PCR) material. This ensures consistent colour accuracy, technical performance and the integration of recycled content where required.

Once manufacturing parameters for a custom bottle have been optimised, all key processing data – including parison graphs, extruder temperatures, blowing pressures and cycle timings – are digitally stored within the machine's memory. This data-driven approach minimises mould changeover downtime and ensures repeatable quality across production runs.

Nexus Packaging offers a fully integrated development service, taking projects from concept and design through modelling, tooling and into full production, typically within 16 weeks.

"Our focus is on combining technical precision with production efficiency," said Charles Wagner, Manufacturing Director at Nexus Packaging. "By configuring our equipment for flexibility and storing optimised production data, we can deliver bespoke packaging solutions with speed, consistency and reduced downtime."

Nexus Data Systems Ltd
Nexus Packaging
enquiries@nexpack.co.uk

Spiderless Pipe Die for Extrusion Introduced

Guill Tool, the global leader in extrusion tooling, recently announced the availability of its Spiderless Pipe Die. This new offering utilizes precision tooling to provide increased material savings compared to conventional basket dies for pipe extrusions.

In the coming years, the global market for pipes used in irrigation/sewage systems and industrial applications is expected to grow. This increased demand for pipes is driven by the increasing need for water and wastewater infrastructure, as well as the growth of 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 including the U.S. and Europe.

Guill Spiderless Pipe Die

This new pipe die is typically capable of providing a finished extrusion with an OD of up to 4", with larger diameter tooling engineered upon request. It's offered in 4140 steel or stainless with heat treating.

The company's Spiderless Pipe Die design differentiates itself from a basket die with its focus on precision tooling gained from decades of experience in multi-layer extrusions, medical tubing, flow analysis and Guill's ISO 9001 and AS9100 (Aerospace) quality systems. The significance of the Guill Spiderless Pipe Die becomes evident when considering material savings seen through ease of startup and precise concentricity of the product.

Guill's Spiderless Pipe Die is now available to meet the needs of its customers as they consider all the factors needed to remain competitive in pipe production. This product was entirely conceived, designed, engineered and manufactured at the Guill factory in West Warwick, Rhode Island.

For additional information:
https://www.guill.com/series/900-series

Guill Tool & Engineering
Jacob Marcure, Senior Design Engineer
jmarcure@guill.com
Peter Leary, Technical Sales Engineer,
Extrusion Division
pleary@guill.com

Market Study: Plastic Pipes

Will the economic upturn finally come in 2026? There is hope, at least for manufacturers of plastic pipes. For some time, the European market for PVC pipes, polypropylene pipes, and pipes made of other polymers stagnated at around 5 million tonnes per year. However, Ceresana market researchers are now expecting a slight recovery in demand: EU directives on drinking water (DWD) and urban waste water treatment (UWWTD) are gradually coming into force and driving the expansion of water pipe networks. Adapting to climate change and extreme weather events requires investment in new pipes in agriculture and horticulture, but also in many municipalities, for example for pressure pipes, plumbing pipes, or water treatment. In addition, there is a growing need for empty conduits to protect power and telecommunication lines: For cable protection, often made of polyethylene, Ceresana expects growth of 1.7% per year.

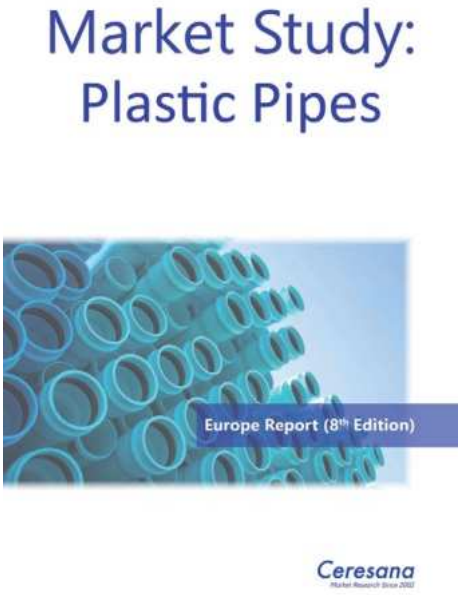
The study in brief:

Chapter 1 analyzes the entire European market for plastic pipes – and provides forecasts up to the year 2034. Key figures on revenues (in dollars and euros) as well as demand and production volumes (in tonnes) are provided. Revenues are also broken down into application areas. Demand is broken down in detail for the various application areas, construction segments, and plastic types. The production volume is broken down by type of plastic.

Chapter 2 provides specific market data on plastic pipes for 23 European countries: Turnover, imports and exports, production and consumption volumes. The following application areas are analyzed: Sewage disposal (broken down into the sub-segments "in-building installations" and "external utility networks"); Potable water supply (broken down into the sub-segments "in-building installations" and "external utility networks"); Cable protection; Gas supply; Agriculture; Industry; other applications.

The following plastic types are differentiated: Polyethylene (PE); Polypropylene (PP); Polyvinyl chloride (PVC); Glass fiber reinforced plastics (GRP); other types of plastic.

The figures for the various construction segments are also shown separately: New construction; Renovation; Residential construction; Commercial construction and infrastructure.



Chapter 3 provides company profiles of the largest plastic pipe manufacturers in Europe – clearly arranged according to contact details, revenues, net income, product range, production sites, and short overview of the company. In-depth profiles of the 59 most important plastic pipe producers are given.

https://ceresana.com/en/produkt/plastic-pipes-market-report-europe

New Continuous Loss-in-Weight Feeder Launched

Movacolor, a prominent player in dosing and blending solutions for plastics processing, announced the launch of the MCS Continuous Loss-in-Weight Blender, a new continuous system to deliver fast-response control in extrusion processes where throughput can change drastically over short periods.

In industries such as filament yarn production, melt pump interruptions can cause sudden and frequent output fluctuations. These changes often lead to unstable material flow, inconsistent blend ratios, increased scrap, and rising material costs. While traditional continuous loss-in-weight systems offer high accuracy, many are limited in how quickly they can react when extruder demand changes rapidly.

The MCS Continuous Loss-in-Weight Blender has been developed specifically to address this challenge.

A New Approach to Gravimetric Dosing

Unlike traditional in-line systems where dosing units feed directly into the machine inlet, the MCS Continuous Loss-in-Weight Blender is designed with a weighing hopper positioned underneath the dosing machines. In this configuration, all dosing units feed into a weighing hopper with a hopper level sensor.

Because the exact hopper capacity and target material level are continuously known and monitored, the system can rapidly adjust dosing speeds to maintain a stable level in the hopper, even during sharp throughput changes. This enables stable feeding behaviour and consistent blending performance under conditions where conventional systems struggle to respond fast enough.

Key Benefits

- Fast response to throughput fluctuations.
- Rapid dosing corrections maintain a stable hopper level and consistent feeding performance.
- Reduced scrap and material waste.

(© 2023 Movacolor)

- Fewer off-spec products during pump interruptions and ramp-ups.
- Lower material costs and higher ROI.
- Improved dosing control reduces overdosing and helps maintain operation closer to setpoint.
- Especially suited to applications such as filament yarn extrusion, where throughput changes frequently.

"Even at very low extruder capacities of 20 to 30 kg/h and masterbatch additions of just 1%, the system remains stable and accurate. In addition, the high-temperature-ready design makes it fully suitable for PET processing, opening up applications that are not reliably supported by alternative solutions," said Klaas Talsma, Product Manager at Movacolor.

Movacolor
www.movacolor.com

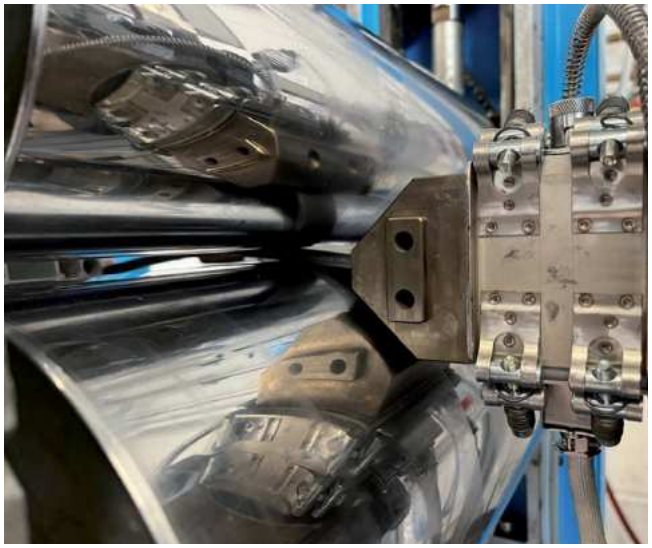
German Institute Offers Comprehensive Support in the Field of Thermosets

From recipe development to material testing, the SKZ Plastics Center combines decades of expertise with state-of-the-art technology to create customized, sustainable, and high-performance materials for industry. For five years, SKZ has also been supporting research and development in the field of thermosetting plastics.

The SKZ offers companies comprehensive services in the field of thermosets and supports them in the development of innovative and sustainable material solutions. With decades of experience and close links between industry and research, SKZ is a reliable partner for challenging projects. The Würzburg-based plastics institute has been supporting industrial companies in optimization and development since 1961. Historically known for its expertise in thermoplastics, SKZ began building up deeper knowledge in the field of thermosets and silicones in 2020.

To this end, a new research group for cross-linked materials was established – with resounding success: Five years later, the group already has four employees and can look back on a series of successful projects. The core topics relating to thermoset materials have been established, and knowledge transfer to industry is continuously maintained.

This means that the still young group is ideally positioned to support industrial companies with a comprehensive range of services in the field of thermosets and to advance innovative projects. From initial consultation and material



SKZ uses practical experience and state-of-the-art equipment to provide companies with optimal support – including in the field of thermosets (Photo: Frederik Hellert, SKZ)

research to the development of individual formulations and the production of samples and prototypes, SKZ reliably accompanies its partners throughout the entire process. Thanks to state-of-the-art compounding technology, tailor-made solutions are created that are precisely tailored to the requirements of the respective application. It is also possible to synthesize proprietary resin systems on a laboratory scale, so that products can be adapted to specific requirements right from the first molecule. In addition, SKZ offers precise material data determination in accredited testing laboratories – for the highest quality and safety.

Currently in high demand are innovative mixtures that SKZ also develops or supports in their development: conductive systems, highly filled materials, or fiber-reinforced thermosets for extreme loads. Partners of the institute benefit not only from SKZ's comprehensive expertise, but also from access to the latest technologies, trends, and scientific findings. This combination of practical relevance and research makes it possible to optimally implement complex requirements such as mechanical properties, sustainability, or special functionalities.

"Thermosets are key materials for numerous industries. With our knowledge and the modern capabilities at SKZ, we help companies to realize innovative and sustainable solutions," explains Thomas Zimmermann, Group Leader for Crosslinked Materials at SKZ.

As part of a strong network of industry, research, and education, SKZ promotes the exchange of know-how and accelerates innovation. In addition, SKZ supports companies in the development of resource-saving materials and recycling strategies in order to combine ecological and economic goals.

SKZ Plastics Center
Thomas Zimmermann
t.zimmermann@skz.de

New PLASTRON® LFT Grades with Post–Consumer Recycled (PCR) Content

Polyplastics Group has announced the development of new PLASTRON® long-fiber thermoplastic (LFT) grades made of post-consumer recycled (PCR) polypropylene (PP) content. The two new developmental grades, which deliver mechanical properties equivalent to virgin material products, are undergoing sample production and evaluation.

As part of Polyplastics' commitment to advancing sustainable material solutions, these new grades – PLASTRON® RSG20011 and RSG20013 – feature more than 30% PCR content combined with 30% to 40% glass fiber reinforcement. The newly developed grades offer mechanical performance – such as high rigidity and excellent impact strength – equivalent to the company's commercial products made of virgin raw materials.

By utilizing post-consumer recycled (PCR) materials collected from the market, the newly developed grades contribute to reducing the product carbon footprint (PCF). Compared with products made from virgin raw materials, these grades achieve a reduction of more than 20% in carbon footprint. The PCF values shown above were calculated based on the GHG Protocol and ISO 14067, using operational data over a defined period along with reference values from reliable databases. These figures are not guaranteed values.

Polyplastics will further expand its product lineup to include products utilizing recycled materials as well as those incorporating environmentally friendly reinforcement materials such as cellulose fibers. These will help reduce environmental impact and enhance the ability to meet customers' diverse needs. Through these efforts, the company aims to meet an even broader range of application needs and contribute to a more sustainable future.

Polyplastics Co., Ltd.
www.polyplastics.com

Lab Capabilities Expanded

Guill Tool, global leader in extrusion tooling, has expanded its lab capabilities to better serve the global extrusion market with the creation of Guill Labs. The labs include the company's state-of-the-art rheology lab and a facility focused entirely on the extrusion process.

Tensile testing rig in the extrusion facility

The rheology lab's scanning calorimeter

Guill's existing rheology lab measures the flow characteristics of plastics and rubber to predict how a customer's material will flow through the company's extrusion dies before production. Tooling geometry is virtually optimized, and the project can be viewed in 3D CAD. Machines used include a rotational rheometer, scanning calorimeter and thermal conductivity meter.

The rotational rheometer quickly generates visco-elastic data for polymer melts, precisely capturing polymer melt properties. Test temperature ranges between ambient and 300°C. The lab's scanning calorimeter characterizes the thermal properties of a polymer sample, such as crystallization temperature, glass transition temperature and heat

Design Engineer Jacob Marcure working in the rheology lab

Fluidized bath in the test extrusion facility

capacity of the sample. Knowing these thermal properties permits the simulation of shear heating and hot and cold spots in the flow area. The thermal conductivity meter is used to determine the thermal conductivity of the polymer sample across a range of temperatures.

This in-house lab provides faster turnaround on test results, reducing delays during the design process and offering better control over the testing parameters. The result is a high-quality part delivered on time.

The new test extrusion facility features various pieces of equipment including two Killion 1.25" extruders, an RDN 2.0 PVS vacuum tank, one Keyence LS9000 dual axis laser gauge, two Dri Air ARID-X 10 30lb capacity dryers, an RDN 212 belt puller, an Accurate Thermal Systems FT-BLL47 fluidized bath and a new Mark-10 F1505-IM tensile testing rig. In addition, the test lab permits single and co-extrusion capabilities with its tried-and-true die designs. Access to exotic extrusion processes such as rotary die extrusion of filament and tubular end-products are also available. The addition of the tensile testing rig allows for mechanical testing of finished product samples in-house for even faster trial results.

Supporting extrusion trials, the test lab also offers extrusion training, die cleaning services, sample inspection, and end-product testing. Guill's fluidized bath has a 50°C-605°C temperature range and a working volume of 15.7" x 47."

Customers can test materials, dies and actual extrusion run time… all on Guill premises.

Guill Tool & Engineering Co., Inc.
Jacob Marcure, Senior Design Engineer
jmarcure@guill.com
Peter Leary, Technical Sales Engineer,
Extrusion Division
pleary@guill.com
www.guill.com

Greater Safety for Sustainable Plastics

Polypropylene recyclates are becoming increasingly important, especially in long-lasting applications. To ensure their reliability, the SKZ Plastics Center is working on a new testing method based on the Strain Hardening Test (SHT).

A quantitative assessment of material quality is crucial for the use of polypropylene recyclates. In particular, the failure mechanisms relevant to polyolefins must be taken into account – above all, stress crack resistance, i.e., a material's ability to resist slow crack growth. The strain hardening test (ISO 18488) is already established for virgin polyethylene in pipe applications.

On this basis, the SKZ is launching a two-year research project to develop a comparable, easy-to-use method for polypropylene recyclates. Initially, recyclates will be simulated by mixtures of materials with known properties.

"Our main focus is on the dependence of the test results on mixture proportions and ratios," explains Britta Gerets, Senior Engineer at SKZ.

The method will then be validated on post-industrial (PIR) and post-consumer (PCR) recyclates. In addition, the extent to which stress crack resistance can be improved by the targeted addition of virgin material will be investigated.

Interested parties can contact the research team via the SHT_PP-Rezyklate project page or by email.

Milled material, recycled compound, film, and test specimens for the strain hardening test (Photo: Luca Hoffmannbeck, SKZ)

The SKZ Plastics Center
Britta Gerets, b.gerets@skz.de
www.skz.de

Skilled Workforce for India's Plastic Recycling Industry

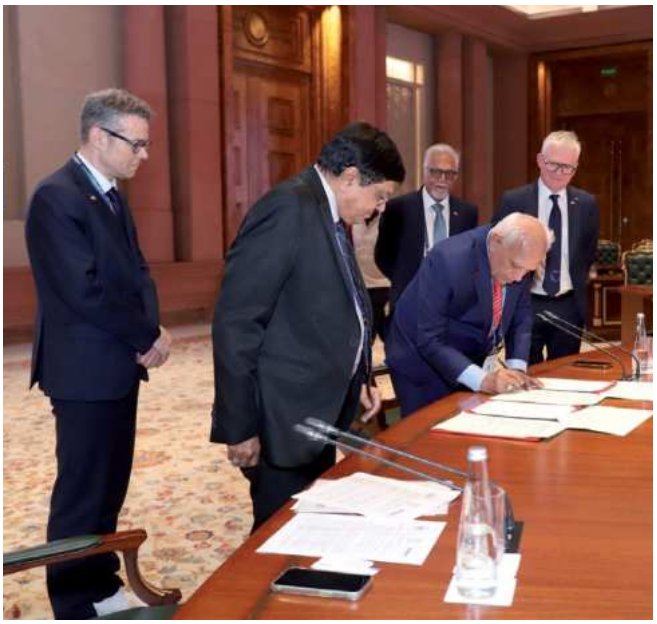
EREMA and the Arvind Mehta Technology & Entrepreneurship Centre (AMTEC) of the The All India Plastics Manufacturers Association (AIPMA) signed a Memorandum of Understanding (MoU) during a formal ceremony on 5 February 2026, marking the launch of a new Recycling Skill Center in Mumbai. The initiative provides a strong impulse for practice oriented training in plastic recycling and makes an important contribution to further strengthening the circular economy in India.

The new training centre is being established at AMTEC in Mumbai by the end of May 2026. It aims to help meeting the growing demand for qualified professionals – in particular operators and supervisor – in India's plastic recycling sector over the long term. At the core of the program is a 72 hour training course that combines theoretical foundation with practical, hands on instruction. To support the training operations, EREMA is providing an INTAREMA® 605 TE recycling machine with a capacity of 50 to 100 kg/h free of charge, enabling participants to learn under real industrial conditions.

Joint initiative strengthens skills and technological expertise

"We are pleased to be part of this initiative, which sends a strong signal for the further development of plastic recycling in India. Close and trusting collaboration between India and Europe is essential for a sustainable shared future," emphasised Markus Huber Lindinger, Managing Director at EREMA, during the signing ceremony. "High end technology unfolds its full potential when operated by well trained professionals. With this centre, we are making an important contribution to providing tomorrow's specialists with an optimal foundation for their professional careers."

The signing of the Memorandum of Understanding in Mumbai marks the launch of a joint initiative by EREMA and AIPMA to promote training and skills development in plastic recycling in India (Pictures Copyright: AIPMA)



A handshake between Markus Huber-Lindinger (EREMA) and Arvind Mehta (AMTEC) underscores the joint efforts to sustainably strengthen the skilled workforce required for India's plastic recycling industry

Arvind Mehta, Chairman of AIPMA's AMTEC & AIPMA Governing Council, also highlighted the importance of the partnership: "With this new training centre, we are closing the previously existing gap between theoretical and practice oriented education. Working together with EREMA enables us to teach students, operators and supervisors directly on industrial equipment and thus develop a new quality of skilled professionals for India's recycling industry."

Qualified professionals for the industry of tomorrow

The program curriculum is developed by AMTEC and supported by EREMA's practical technical expertise. Upon completion, graduates will have in-depth knowledge of the operation and maintenance of modern recycling systems and will be well-prepared for employment in the plastics recycling industry – particularly with regard to working on EREMA systems – or ideally placed to progress in their current role. AMTEC acts as a link to the industry and assists in finding employment opportunities within its member companies as well as recyclers.

EREMA Engineering Recycling Maschinen und Anlagen GmbH
www.erema.com

20th Anniversary – *From a Visionary Idea to Complete Solutions for Plastics Recycling*

MAS Tech celebrated its 20th anniversary. What began on March 24, 2006, with a bold idea, four pioneers, and a single container has grown over two decades into an internationally recognized technology partner for high-quality plastics and PET recycling.

MAS was founded by recycling pioneer Helmuth Schulz, whose vision of a conical co-rotating twin-screw extruder was initially considered unrealistic – until it became reality. The patented technology set new benchmarks in plastics processing and laid the foundation for MAS's success.

"Everyone said it couldn't be done. Then someone came along and simply did it."

This mindset shaped the very beginning of MAS – and continues to guide the company today.

Technological Progress as a Guiding Principle

As early as 2008, MAS introduced the first conical co-rotating twin-screw extruder. Since then, the company has consistently driven technological advancement with one clear goal: making high-quality recycling economically viable, energy-efficient, and future-ready.

Today, MAS Tech stands for complete recycling solutions from a single source – from material preparation through extrusion and filtration to high-quality film recycling. Modular, upgradeable, and designed with minimal interfaces.

Second Generation – Continuity and Innovation

Since 2014, MAS Tech has been successfully led by CEO Martin Schnabl. Under his leadership, the company has evolved into an internationally established provider of comprehensive, forward-looking recycling solutions.

At its headquarters in Pucking, Upper Austria, an interdisciplinary team combining engineering, process development, machine manufacturing, and service expertise works closely together—supported by a strong international partner and sales network.

Milestones of Recent Years

With its latest technology platform, the iQonicTWIN Solution Series, MAS underlines its ambition to rethink recycling:

- iQonicTWIN HyperPET A revolutionary pre-extrusion solution for food-grade PET recycling, featuring integrated SSP using infrared radiation and vacuum – completely without nitrogen. For the first time, it enables applications such as tray-to-bottle, significantly expanding the available raw material base.
- iQonicTWIN PreDensifier Developed for demanding post-consumer films, fibers, and lightweight fractions, delivering high energy efficiency, stable quality, and maximum process reliability.

These innovations are complemented by proven solutions for Re-Compounding as well as the highly efficient Twin-Compound Line for demanding compounding applications.

Together, these technologies exemplify what MAS has stood for over the past 20 years: Technology – next level.

MAS – Maschinen- und Anlagenbau Schulz GmbH
www.mas-tech.com

Advanced Pyrolysis Oil Upgrading Technology for Circular Plastics

Clariant, a sustainability-focused specialty chemical company, announced the successful completion of a collaborative pilot-scale project with Borealis, a leading provider of advanced and circular polyolefin solutions, and SINTEF, one of Europe's largest independent research organizations. The partnership successfully demonstrated Clariant's pyrolysis oil (pyoil) upgrading technology, marking a significant milestone in advancing circular economy solutions for the plastics industry.

HDMax: Enabling the circular economy through proven pyoil upgading technology (© Clariant)

Breakthrough in Plastic Waste Recycling

The collaboration centered on upgrading pyoil derived from plastic waste to steam cracker-compatible feedstock that fully meets cracker-grade quality specifications. Using Clariant's proprietary HDMax catalysts, the pilot-scale testing conducted at SINTEF's research facility in Norway delivered excellent results, successfully transforming plastic waste-derived pyoil into high-quality feedstock suitable for virgin polyolefin production.

The HDMax catalyst achieved full conversion across all critical parameters: complete saturation of dienes without gum formation — a crucial requirement for downstream processing — along with complete conversion of contaminants like oxygenates, nitrogenates, and halogenides. All product quality specifications were met, validating the technology's readiness for industrial application.

"This successful collaboration proves that closed-loop plastic recycling can work effectively on an industrial scale," said Gene Mueller, VP and Head of Ethylene at Clariant Catalysts. "Our HDMax catalyst technology enables plastic waste to be converted back into feedstock that meets the stringent quality requirements of steam crackers, creating a true circular pathway for plastics."

Industry-Leading Efficiency Through Single-Step Processing

A key differentiator of Clariant's HDMax technology is its ability to achieve all required specifications in a single multi-layer hydrotreating reactor, compared to alternative technologies that require three to four reactors. This streamlined process significantly reduces capital investment, operational complexity, and energy consumption. Additionally, the technology enables subsequent hydrocracking to produce naphtha-like hydrocarbon fractions, further enhancing process efficiency and product flexibility.

The three-party partnership leveraged the unique strengths of each organization:

- Clariant provided a tailored catalyst design and commercial samples of its specialized catalysts: HDMax catalyst for pyoil upgrading and HYDEX™ for hydrocracking.
- Borealis defined the required target quality of the pyoil and contributed industry expertise as a leading European polyolefin producer offering chemically recycled polyolefin solutions under the Borcycle™ C portfolio.
- SINTEF conducted comprehensive pilot-scale testing and validation at their state-of-the-art research facility in Norway

Advancing the Circular Economy

The successful demonstration validates a proven pathway for reintegrating recycled plastic-derived materials into industrial production of high-quality materials. By converting plastic waste back into high-quality feedstock, this technology supports the transition to a more circular economy where plastic materials can be recycled without compromising on quality. This pilot-scale validation demonstrates how strategic collaboration accelerates innovative circular plastics solutions. The partners' combined expertise in specialty chemicals, research capabilities, and industrial production knowledge has created a foundation for further development and potential commercial implementation.

Clariant
www.clariant.com

Platinum Sustainability Rating from EcoVadis Earned

Orion earned a Platinum rating for its 2025 performance from EcoVadis, one of the world's largest independent providers of business sustainability ratings, the company announced.

The Platinum designation places Orion in the top 1% of companies worldwide evaluated by EcoVadis. The assessment measures performance across four areas: environment, ethics, sustainable procurement, and labor and human rights.

"Achieving a Platinum rating for 2025 capped another successful year for sustainability at Orion," the company's CEO, Corning Painter, said. "Among many achievements, we launched bio-circular grades of carbon black, improved energy efficiency across our operations, expanded leadership training programs and won an industry award for safety performance at our plants."

Painter added, "EcoVadis raises its standards every year, so maintaining our Platinum rating will require a stronger performance in 2026. But I'm confident our colleagues across the world who worked so hard to earn Platinum in 2025 will rise to that challenge again, as Orion continues to make progress on longer-term strategic sustainability goals aimed at cost-effective grades of carbon black."

In addition to the EcoVadis recognition, Orion maintained a strong B score from CDP, a global nonprofit organization that manages the world's leading system to measure, manage and disclose an organization's environmental impacts.

Announced in December 2025, the CDP rating recognized Orion's progress in mitigating the impact of climate change through effective emissions management. Notably, this past year's assessment included an upgraded A rating on CDP's Supplier Engagement Assessment, based on Orion's governance, targets, scope 3 emissions and value chain engagement.

Orion S.A.
orioncarbons.com

Presentation at GreenTech Americas with a Focus on Greenhouse Film

At this year's GreenTech Americas in March in Querétaro, Mexico, the RKW Group presented its product range with a focus on greenhouse films.

Excellent results with advanced greenhouse films

RKW greenhouse films are characterized by their reliability and robustness even under challenging conditions. They protect crops from frost, wind, and rain, ensure consistently high quality, and support precise control of harvest timing. This enables multiple harvests within a single year.

RKW's Hytilux® greenhouse films are specifically designed for the special light and temperature requirements of many open-field vegetable and fruit crops. Thanks to their excellent light transmission, they create optimal growing conditions in the greenhouse while also helping to reduce heating and energy costs. Enhanced reflection of long-wave infrared rays slows down nighttime cooling of the greenhouse. Their excellent thermal properties minimize temperature fluctuations and thus reduce the temperature stress of the plants.

Grafeno® high-performance film provides reliable protection for plants even under challenging conditions and ensures that the quality of the crops remains consistently high. It protects plants against frost, wind, rain, and overheating and supports precise control of harvest timing. In addition, this greenhouse film features high resistance to pesticides as well as excellent mechanical strength. Its anti-dust effect ensures greater light transmission and easier cleaning of the film.

RKW's Comprehensive Product Portfolio for Horticulture: Nonwoven Crop Cover, Early Harvesting Films and Greenhouse Films

RKW's Hytifite® greenhouse films are known for their robustness and solid quality. They were developed specifically for export markets and have been used worldwide for many years. They continue to enjoy great popularity due to their reliable performance. The smooth surface ensures easy cleaning of the film. Excellent thermal properties, an effective anti-drip effect, outstanding anti-dust properties, and high light transmission complete the Hytifite® profile.

With its comprehensive portfolio of greenhouse films and other horticultural products, RKW offers tailor-made solutions for cultivating a wide variety of crops in regions all over the world.

RKW SE
rkw-group.com

Biodegradable Multilayer Polymer Films for Sustainable Packaging Developed

Peak Nano announced a new development program to create first-of-its-kind nanolayered biodegradable multilayer polymer films for food, beverage, and medical packaging. Supported by R&D funding from the Greater Akron Polymer Innovation Hub, Peak Nano is leveraging its patented NanoPlex™ metamaterials technology to design an advanced, sustainable alternative to these barrier films without impacting performance.

Selected through a competitive process that reviewed more than 40 proposals from across the region, Peak Nano's project is one of eight receiving Innovation Hub support. It targets to replace traditional multilayer packaging film, which can contain many tightly bonded layers of polymers and additives that are difficult or impossible to recycle. These materials fragment over time, shedding micro- and nanoparticles into soils, waterways, and the broader environment. Peak Nano's high-performance barrier films are designed for distinct performance advantages in demanding food and medical applications, protecting product quality and safety, and are engineered for biodegradability over time.

Peak Nano's NanoPlex technology, developed at Case Western Reserve University with leading polymer scientists like Eric Baer and Lei Zhu, professors of macromolecular science & engineering, enables the creation of films containing thousands of precisely controlled polymer layers, as opposed to melted blends. This makes it possible to combine several polymer characteristics in one material, almost like a circuit board, creating unprecedented control over properties like atmospherics, molecular permeability, biodegradability, conductivity, and insulation. The nanolayer coextrusion and biaxial orientation processes also boost oxygen and water-vapor resistance, improving durability so the films can withstand real-world converting and packaging operations without contributing to long-term microplastic waste.

"With NanoPlex™, we can create nano-layers that let us dial in characteristics like barrier performance, mechanical strength, and even degradability," said Dr. Michael Ponting, Chief Scientific Officer at Peak Nano. "This lets us tackle one of the toughest problems in packaging. We can now design biodegradable nanolayer structures that give converters the barrier and mechanical properties they need, with a much better end-of-life story."

Peak Nano's project is part of a broader slate of Innovation Hub-funded initiatives in biobased materials, recyclable packaging, eco-polymer platforms, and performance materials. The Hub, powered by the Polymer Industry Cluster and the Greater Akron Chamber, is deploying a $42 million Innovation Hubs award and matching funds over four years to advance shared R&D priorities, stand up a polymer pilot facility, and support startups and scaleups bringing sustainable polymer solutions to market.

"The Polymer Industry Cluster was created to tackle shared problems that no single company can solve," said Hans Dorfi, Executive Director and Chief Innovation Officer, Polymer Industry Cluster. "Peak Nano's films show how we can align world-class materials science with our region's deep expertise in polymer science and advanced manufacturing to address global environmental challenges and create new economic opportunities here at home."

THE POLYMER INDUSTRY CLUSTER®
Powered by the Greater Akron Chamber

(Source: Peak Nano Systems)

In the current phase, Peak Nano and its partners will produce prototype biodegradable nanolayer film systems and evaluate them on commercial equipment used for food and medical packaging. Subsequent phases include biodegradability testing, cost and scale-up modeling, and a commercialization roadmap for supplying nanolayered biodegradable films to brand owners and converters at scale. Peak Nano expects to leverage both its Ohio manufacturing footprint and regional partners to bring these materials into broader commercial use.

"This collaboration is about turning leadership in advanced materials into commercial reality with regional economic impact," said Jean-Claude Kihn, former CTO of The Goodyear Tire and Rubber Company and Co-Chair of the Hub's Innovation & Commercialization Committee. "By backing Peak Nano's technology and scale-up in Ohio, we're helping translate the state's century-long polymer heritage into next-generation sustainable materials and high-value jobs."

Peak Nano
peaknano.com

New Game-Changing Technology for Lightweight HDPE Bottles

A new method for making high-density polyethylene (HDPE) bottles was recently introduced by Polyplastics, Colgate-Palmolive, and PTI at The Packaging Conference in Austin, Texas. The injection stretch blowmolding (ISBM) technique - used to make today's ubiquitous PET water and soft drink bottles - has now been adapted to efficiently create thin, attractive, and hot-fillable HDPE containers.

Today, almost all HDPE bottles are made using extrusion blow molding (EBM). This process has a relatively long cycle time and generally results in excess container weight, for instance at the base. Significant (>25%) weight and cycle time reductions have been demonstrated with the new process, which involves incorporating a second component in the HDPE. This component, a Polyplastics ethylene copolymer known as TOPAS® COC (cyclic olefin copolymer), greatly enlarges the processing window for HDPE, rendering ISBM practical and efficient while delivering a recyclable container. TOPAS COC is widely used in the packaging industry in combination with polyethylene (PE) for property enhancement, and in medical applications where extremely high purity is required.

Colgate-Palmolive is exploring the use of COC to enable cost-effective, high-performance packaging that meets increasing regulatory requirements for lighter weight.

Results to date are encouraging and the company plans to continue moving toward commercialization.

Polyplastics has conducted extensive testing at PTI's development site in Holland, Ohio, and PTI has confirmed the hot-fill capabilities of the new technology. PTI expects to work with several brands to aid in preparing for commercial launch of ISBM HDPE for cosmetic, food, medical, household, industrial, and general packaging applications.

TOPAS® COC is a registered trademark of Polyplastics Co., Ltd. in Japan and other countries.

Colgate-Palmolive
www.colgatepalmolive.com

PTI
www.plastictechnologies.com

Polyplastics Co., Ltd.
www.polyplastics.com

Silver EcoVadis Rating Earned

SI Group, a leading global developer and manufacturer of performance additives, process solutions, and chemical intermediates, has earned a 2026 Silver sustainability rating from EcoVadis placing the company in the 85th percentile of all companies assessed worldwide. The recognition marks an improvement from SI Group's 2025 Bronze rating and reflects the company's continued progress in advancing its sustainability strategy.

EcoVadis is one of the world's most widely recognized providers of business sustainability ratings, evaluating companies across four key areas: Environment, Labor & Human Rights, Ethics, and Sustainable Procurement. In the 2026 assessment, SI Group scored above the industry average in all four categories, demonstrating the company's commitment to responsible operations and transparent, ethical business practices in chemical manufacturing.

The improved rating builds on the progress outlined in SI Group's 2025 Environmental, Social, and Governance (ESG) Report, which details measurable achievements across the company's global operations. SI Group has advanced initiatives focused on reducing greenhouse gas emissions, improving energy efficiency, strengthening responsible resource management, and enhancing supply chain transparency.

In addition to operational improvements, the company has implemented new policies, expanded sustainability programs, and achieved additional certifications that support stronger governance and environmental performance across its global manufacturing network.

"EcoVadis provides an important benchmark for evaluating our sustainability performance and identifying opportunities to continue improving," said Mike Farnell, SVP General Counsel and Chief Sustainability Officer. "Achieving a Silver rating is an encouraging milestone that reflects the dedication of our teams worldwide to operating responsibly and supporting our customers with solutions that contribute to a more sustainable future."

SI Group continues to integrate sustainability across the development, manufacture, and application of its chemical technologies, helping customers meet evolving performance and environmental goals while maintaining a strong focus on safety, compliance, and responsible growth.

SI Group
www.siigroup.com/sustainability

EcoVadis
http://ecovadis.com/

ProfilControl 7 PlastX – *Pinpoint Measuring Technology for Plastics Extrusion*

Not more software than necessary, and as little hardware as possible: For the new inline system, ProfilControl 7 PlastX, PiXARGUS has tailored its successful ProfilControl technology specifically to the requirements of typical applications in plastics processing. The result is a powerful inspection system for plastic profiles that combines best performance with outstanding cost efficiency – features that make it the system of choice particularly in the window construction industry. The complete, all-round inspection process ensures reliable detection even of the smallest surface defects and geometrical deviations, making an important contribution to the reduction of scrap and process costs.

PiXARGUS' new inline inspection system, ProfilControl 7 PlastX, has been designed according to the concept: less is more. The new design of the measuring head uses an elaborate mix of materials that requires less hardware and is equipped with pinpoint software, most powerful and highly effective, that incorporates PiXARGUS' proven ProfilControl 7 technology. "We have condensed the hardware and made the system more intelligent," Michael Frohn, sales manager of PiXARGUS, summarizes the new approach.

The flexibly scalable inspection system measures the dimensions of widths, distances, angles and radii, as well as combinations thereof, and detects even the smallest deviations from the target contour. At the same time, the surface inspection function gives flaws such as scratches, bubbles, inclusions, etc. no chance to remain undetected. A dedicated software module has been included specifically for the reliable detection of die grooves.

Focused on the very essential:
The modular sensor head design

The new sensor head design dispenses with a housing and a hinged cover, allowing operators to monitor the inspection process at all times without having to open the sensor head separately. "This saves time and simplifies handling," says Sales Director Frohn.

The open sensor plate with a predefined hole pattern makes it possible to position the cameras in a highly flexible way – using the drilled holes provided to optimally adjust the cameras for the specific inspection task. The modular system can be flexibly expanded from four to six (or more) cameras, depending on the complexity of the profile to be inspected.

For inspections with this open sensor head, PiXARGUS relies on a new illumination concept featuring enhanced LED lighting. High-performance LEDs produce a homogeneous illumination field with maxi-

Pinpoint measuring technology: PiXARGUS' new inline inspection system, ProfilControl 7 PlastX, has been designed according to the concept: less is more. The new sensor head design uses less hardware, and the pinpoint software incorporates powerful ProfilControl 7 technology. As a Two-In-One system, it inspects the surface and geometry of plastic profiles in a single sensor, saving considerable costs as a result

Focused on the very essential: The new, modular sensor head design of the ProfilControl-7 PlastX dispenses with a housing and a hinged cover. Optimally arranged optical sensors and smartly set camera angles enable 100% defect detection with just 4 cameras. The ProfilControl software filters out any interfering external light effects, ensuring a homogeneous illumination field with maximal light yield

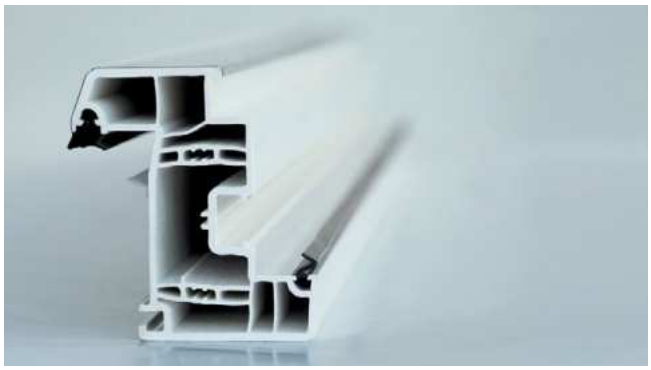
mal light yield, the smart ProfilControl software reliably filters out any interfering external light effects. The standard equipment of ProfilControl 7 PlastX includes an external multi-touch monitor, a mobile support frame, and the encoder.

Made for standard applications: Intelligent inspection with 4 cameras

The basic version of ProfilControl 7 PlastX requires less cameras. By combining optimized optical equipment with high-capacity camera elements, PiXARGUS makes it possible to capture, in particular, the clamping dimensions most reliably. "Where we used to need eight cameras, we now achieve the same high reliability and performance with just four or, at the maximum, six cameras," explains sales manager Frohn.

No chance for grooves: Less scrap also in laminated profile production

Grooves are usually not very obvious, but they can run over extended distances along the profile. Machine operators often notice them rather late or fail to see them completely. Especially in window profile production, it is essential that grooves are detected at an early stage. About 40% of all plastic profiles for windows are laminated with a protective foil directly at the extrusion line, making any surface defects hardly visible afterwards. Therefore, the groove detection module of the ProfilControl 7 PlastX system checks the surface quality prior to the lamination process so that it can indicate any existing defects beforehand. In this way, the module helps to reduce scrap and process costs and produce more economically.



The flexibly scalable inspection system measures the dimensions of widths, distances, angles and radii, as well as combinations thereof. At the same time, the surface inspection function gives flaws such as scratches, bubbles, inclusions, etc. no chance to remain undetected. A dedicated software module has been included specifically for the reliable detection of die grooves

Always the perfect combination of hardware and software: The modular and scalable ProfilControl 7 PlastX system

ProfilControl 7 PlastX is designed to inspect simple to complex profiles such as window seals, zipper profiles, cable ducts, etc. The system can be adjusted most flexibly and in a pinpoint manner to the different quality requirements of plastic profile extrusion. As requested by the customer, the systems can be designed for 360° dimension measurement or 100% surface inspection – or, as a combination of both functions, as an All-in-One solution. Whether for basic applications or complex extrusion processes: In all its equipment variants, ProfilControl 7 PlastX provides maximum functionality, an intuitive HMI and the greatest possible flexibility.

Visit PiXARGUS in Shanghai at Chinaplas from April 21-24 (Booth iNOEX SiST 2.1G02) and in Barcelona at Equiplast from June 2-5 (Booth Comercial DOUMA, Hall 3/C82).

PiXARGUS GmbH
A CiTEX Group Company
Monnetstr. 2, 52146 Würselen/Germany
www.pixargus.com

Inline Defect Detection for Optimal Quality Control in Film Extrusion

Increasing demands for quality control, surface finish, and defect tolerance in plastic films and web materials present manufacturers with ever-growing challenges. In this context, inline defect detection systems offer unprecedented capabilities for precise defect identification, enabling seamless quality control like never before. The high adaptability and customization of these systems play a decisive role in delivering tailored solutions for a wide range of applications.

SBI Mechatronik GmbH (SBI), known for its comprehensive portfolio of inline thickness measurement devices, has expanded its product range with state-of-the-art image processing systems (WIS 1000), characterized by their flexibility and ability to adapt to individual customer requirements.

A skilled team at SBI coordinates product development, manufacturing, and customer service. Additional research and development capacities at the sister company Lohia Mechatronik in India further drive software development, particularly for applications involving artificial intelligence (machine learning).

The Technology

The WIS 1000 system detects and classifies low-contrast defects in plastic films and sheets, nonwovens, and many other substrates. It provides a high-speed solution for the overall quality assessment of most web-based materials.

Highly customizable and flexible, the system is available for a wide range of requirements and configurations, from technical materials to sensitive pharmaceutical applications. It detects all kinds of defects, such as gels, holes, bubbles, contamination, spots, coating inconsistencies, streaks, etc.

The system handles web widths from 10 mm to 10 meters. The high-resolution camera system (advanced line scan cameras) captures precise images of the moving material and can detect defects as small as 10 µm at web speeds of up to 1.000 meters per minute. To maximize the contrast of potential material defects, cameras and light sources are positioned in various setup configurations.

The equally customizable lighting system allows for optimal illumination in each installation, offering high intensity and uniformity with low power consumption (high efficiency: 220 lumens/watt).

Any type of defect can be categorized and differentiated, as well as automatically classified by type and size. New defect categories can be easily defined in the workflow and learned by the system, even with AI assistance.

The powerful system is operated via a resistive touch panel or panel PC. For real-time monitoring, various parameters can be tracked, such as runtime graphs, histograms, and defect density alarms.

The user-friendly, modular, and freely configurable visual interface and control center (HMI) has been designed with a focus on usability, functionality, and productivity. The system enables real-time defect monitoring, classification, and trend analysis of defect density through structured reporting. An intuitive system that makes defects visible.

Picture 1: WIS 1000-System with labelling-station

Picture 2: WIS-1000 System installed at a slitter-line

Applications

Thanks to the flexible arrangement of system components, a wide range of applications can be addressed. These include, for example, pharmaceutical packaging requiring the highest level of quality control, hygiene products where strict standards and certifications are essential, and food packaging films as well as technical films, sheets, and tapes.

Due to this flexibility, the inline image processing technology can be integrated into new production lines already at the extrusion design stage or retrofitted into existing lines.

Picture 1 shows a solution for a Scandinavian manufacturer and service provider of advanced, sustainable plastic packaging solutions. With a strong focus on quality and a goal to optimize all phases of the value chain, the company decided to enhance its quality control in film production.

The system was integrated into an existing PET extrusion line with a maximum roll width of 850 mm, film thicknesses ranging from 0,4 to 2,5 mm, and a line speed of 22 m/min. The critical defect size was specified at 100 µm, with a focus on detecting particles, pinholes, and gels. To achieve optimal illumination for predominantly transparent, opaque, and colored films, a so-called transmission setup was chosen – camera and light source positioned on opposite sides of the film web.

Additionally, the defect detection system includes a labelling station. Quality-relevant areas are marked and identified by automatic, contactless application of self-adhesive labels, enabling downstream process optimization (e.g. thermoforming).

Extensive analysis tools are available to users, displaying all defects on a complete roll, including key data such as defect types, sizes, and densities.

Despite the system's individual customization, installation and commissioning on-site at the customer location were completed within just a few days.

For a leading Indian manufacturer and supplier of specialty packaging, including sustainable ultra-high-barrier solutions as well as labels, coatings, and thermal lamination films, an inspection system was installed on a slitter line.

Picture 2 shows the system configuration for metallized BOPP films, with a thickness range of 8 to 80 µm, a roll width of 2.500 mm, and web speeds of up to 800 m/min. The critical defect size was 100 µm, and the goal was to detect pinholes, metal oxidation, oil stains, and scratches. Preliminary sample measurements carried out in SBI's in-house test lab defined the optimal system configuration as a direct transmission setup, enabling reliable and accurate detection of all critical defects.

Comprehensive analysis data are also available for this application, and through customized software modifications, a tailored solution was realized for this customer.

Due to the positive experience with the WIS 1000 system, a second slitter line has now been equipped with an SBI defect detection system.

Premium Service

As part of its comprehensive offering for defect detection systems, SBI provides extensive services – from free sample evaluation (defect detection, classification, and analysis), determining and designing the optimal system configuration within production lines (e.g. camera type and number, lighting solution, mechanical fixtures, software packages), to on-site customization, training, and support – available 24/7 worldwide.

For specific requirements that demand on-site evaluation, inline tests can be conducted on production lines to demonstrate system detection capabilities and support informed investment decisions.

Conclusion

The integration of inline defect detection systems into extrusion lines represents a decisive step toward seamless quality control, documentation, and production optimization. Thanks to their adaptability and customization, a wide range of applications can be supported.

System components tailored specifically for the plastics processing industry allow for competitive pricing and ensure superior quality control at manageable costs.

SBI Mechatronik GmbH
Kaplanstraße 12
2020 Hollabrunn, Austria
www.sbi-mechatronik.com

QC Off-Line Measuring Devices for Precision Quality Control

Zumbach Electronic – the world-leading manufacturer of inline measuring solutions for over 60 years – has recently unveiled its latest innovation in precision measurement technology: the QC non-contact, off-line measuring stations, designed to deliver fast, accurate, and repeatable measurements for wire, cable, and tube samples. These systems set a new benchmark for quality control in manufacturing environments, ensuring compliance with exacting specifications and enabling production optimization.

QC 2: Advanced Measurement for Wire, Cable, and Tube Samples

The QC 2 system combines cutting-edge components to provide unparalleled accuracy and ease of use, and consists of a high-precision diameter measuring head, a motorized rotating sample holder with automatic sample ejection for piece measurement, and a USYS-Touch processor with specialized software for data evaluation.

This system is ideal for quality control laboratories or factory floors, offering operators a simple, repeatable solution for measuring outside diameter and ovality. Unlike traditional micrometers or mechanical indicators- which can suffer from calibration errors or operator variability – the QC 2 guarantees consistent results regardless of user input.

Key advantages of the QC 2:

- Accurate and user-friendly measurement method
- Quick feedback for production optimization

QC 2 – Wiremeasurement

- Automatic rotation and measurement start with a single key press
- Specially designed rotating holder for precise sample positioning
- Comprehensive statistics (min, max, average, standard deviation) at the touch of a button
- Data upload capability for further processing

QC 2 – Piece Measurement

QC 4: Precision for Hose and Tube Samples

For hose and tube applications, Zumbach offers the QC 4 system, which measures outside diameter and calculates inside diameter and wall thickness. Like the QC 2, it delivers fast, accurate results and can be deployed in both QC labs and on the plant floor, providing operators with a simple and repeatable solution for measuring parts or cut samples of extruded products.

Key advantages of the QC 4:

- Simple placement on a reference pin
- Multiple measurements around the sample circumference
- Two statistical modes:
  - ▸ One measurement across several samples
  - ▸ Several measurements on one sample

QC 4 – Piece Measurement

• Instant calculation of min, max, average, and standard deviation
• Easy data export for advanced analysis

Both QC 2 and QC 4 provide immediate feedback on whether parts meet specification within given tolerances, helping manufacturers:

• Reduce scrap and rework
• Optimize production processes
• Ensure consistent product quality

With their accuracy, speed, and operator-friendly design, Zumbach's QC systems represent a significant step forward in quality assurance for wire, cable, hose and tube manufacturing.

ZUMBACH Electronic AG
P.O. Box CH-2552 Orpund, Switzerland
sales@zumbach.ch,
www.zumbach.com

High Performance Film – Coreless Production

SML to demonstrate its leadership in stretch film lines at the Plast Milan

As an established market and technology leader in stretch wrap film lines, SML offers production lines for all types of stretch film application – and with a wide range of equipment options and features. One of SML's most successful lines, the MiniCast, will be shown in operation at the Plast 2026 trade show. Despite the line's low space requirements, the 1.5 m wide MiniCast is certain to impress trade show visitors with its performance.

Coreless production

In collaboration with DOW, SML will run the MiniCast twice daily, producing ultra high quality films from 100 % polyethylene – fully recyclable, of course. In addition to this, the production of coreless film rolls will be part of the demonstration. The production of coreless machine rolls for high speed wrappers, weighing 16 kg, will be demonstrated at the trade show stand. "We want to show how easy and fast it is to switch from core to coreless production," explains Thomas Rauscher, Product Manager at SML. To address this, SML has developed innovative methods to control and regulate the tension of the film during the winding.

Technical set-up

The MiniCast machine on show will be equipped with 4 extruders and a 5-layer feedblock in combination with a Reflex die from Cloeren. It also comes with the time-proven 1,600 m diameter single chill roll, a new thickness measuring device, and the widely-sold W4000 turret winder. The 3-up winder version showcased will produce rolls at 3 x 500 mm net film. An ESTL Film Performance Tester will also be available on site, allowing visitors to check the quality of the films straight away.

SML Maschinengesellschaft mbH
Gewerbepark Ost 32
A-4846 Redlham, Austria
www.sml.at

Status Report and Outlook of Pipeheads for Polyolefines *(Part 2)*

Technical requirements and features of pie heads

High throuput at low pressure

Low pressure influences pumping energy of extruder, the mechanical design, i.e. the number and size of screws. This influences the time required for maintenance and mounting.

Low pressure also affects the melt temperature in the extruder. If the pressure at the screw tip is high, the melt temperature will increase. Low pressure has no negative influence on plastication because the extruder achieves plastication by shearing and not by pressure. That's why the calculation of pressure build-up is important, as shown before. Finally, the total pressure of the entire system, from the extruder flange to the end of the die, is the sum of the sections. The target is for it to be below 250 bar. Adapters play an important part because, in space-based extrusion, adapters are sometimes long and can create high pressure if the cross-section diameter is too small.

Optimised flow with a minimum of eccentricity and thermal centring

Equal circumference flow with the lowest possible eccentricity of the wall is needed to reduce weight and save raw materials. This is especially important for heavy wall pipes. Today's pipe tools, which are based on spiral distributors, are optimised to the extent that automated mechanical die centring systems have disappeared from the market. New PE polymers with high strength now have a flow behaviour that causes less sticking to the steel flow channel. This effect improves the thermal centring effect, which is well known in PVC processing.

The front part of the die is segmented into eight or twelve separate heating zones, and the flow can be influenced by temperature – a higher temperature in a given segment leads to more flow in that segment.

Melt cooler for pipes with high wall thickness

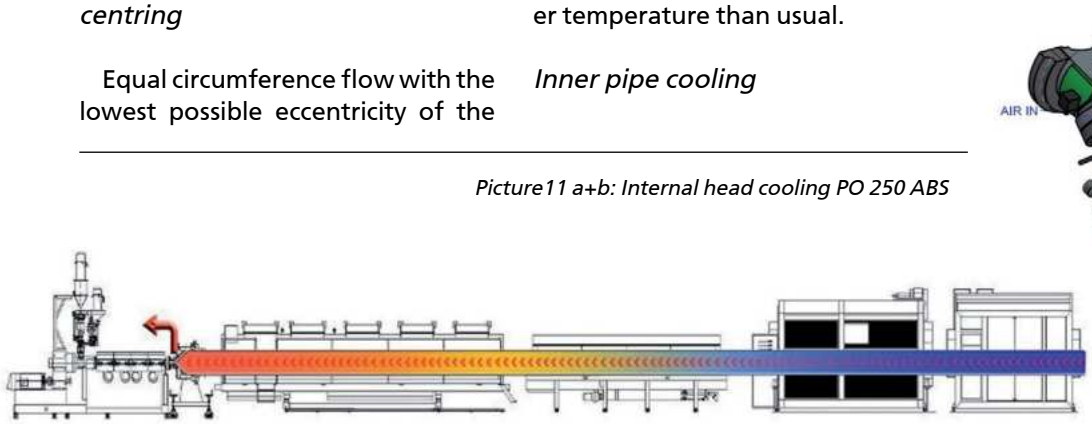
Sagging occurs due to the weight of the wall thickness and is a flow effect that occurs outside the die head. This is a polymer behaviour: the higher the viscosity at very low shear rates and the lower the melt temperature, the less the sagging effect. However, there are limits to extruding wall thicknesses over 100 mm. In this case, the head can be equipped with a melt cooler to reduce the melt temperature in the head. This concept also requires the ability to operate the head at a lower temperature than usual.

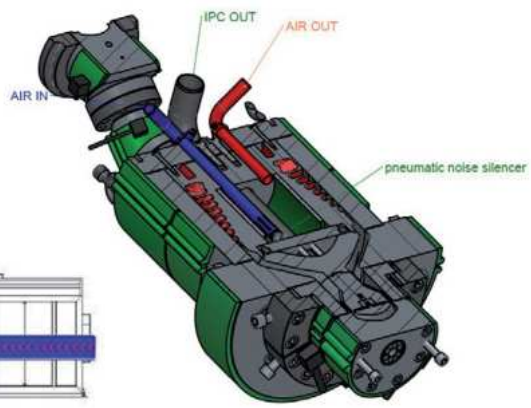
Inner pipe cooling

Picture 10: Thermal centered die

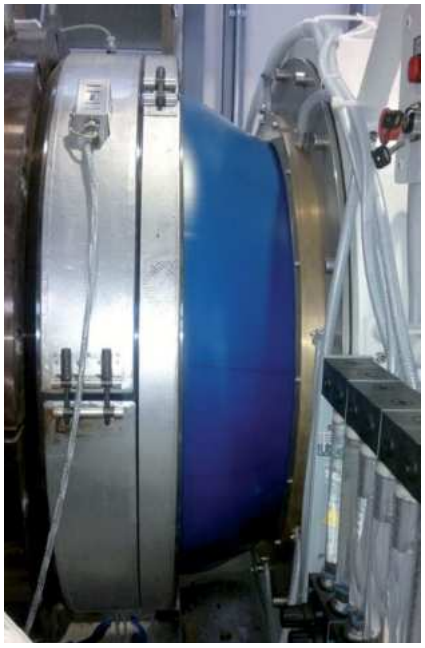
Higher output rates require a longer cooling time. Up-to-date tools should offer the possibility of cooling the pipe from the inside as well, which not only impacts the cooling length, but also the roundness, eccentricity and internal stress of the tubing after cutting, as well as exhausting some evaporated waxes of PE, which would otherwise condense on the inner surface. Internal pipe cooling reduces the thermal load on the material, as can be seen in the OIT value. High-pressure blowers with an airflow of up to 30,000 m³/hour are used to suck air from the pipe end through the pipe and out of the building.

Depending on the SDR ratio, this cooling effect reduces the cooling length by between 5 and 30%. Additionally, in some cases, the spray tank can be removed from the cool-





Picture11 a+b: Internal head cooling PO 250 ABS



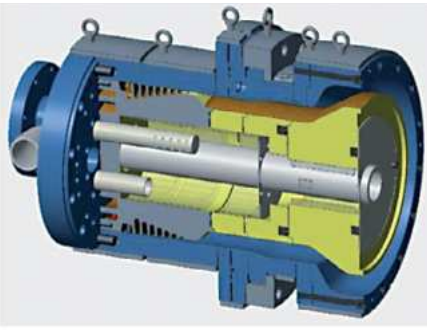
Picture 12

ing length while maintaining the same cooling length, leading to additional energy savings. Overall, such a system is more energy efficient because the cost and power of the blower is much lower than that of spray tanks, which can be eliminated due to IPC.

Internal head cooling

is needed for large tools, too. Internal head cooling is required for heads with a diameter of 400 mm or more. The higher the output rates, the greater the long-term temperature increase inside the head. Air cooling inside the head can be easily installed, and the blower is connected to the internal heater via a 3-point controller – it works like a heating/cooling unit in a barrel. The head is closed and sealed inside, so the air blowing inside comes out via an exit air duct. The airflow is controlled and enters and leaves via small pipes.

Air cooling keeps temperatures stable over the long term. Air cooling systems are efficient and have low operating costs, and can replace old, complicated systems with cooling blocks tempered by an external unit using oil or water. This system works independent with the ipc system. This is important because only a independent system can lead to the optimum result.



Picture 13

Wide dimension range

We have a solution whereby the basic head, which has a certain melt outlet diameter, can be used to produce pipes larger than the melt outlet diameter. This is made possible by changes to the mechanical design as well as the excellent eccentricity. Furthermore, more pipe sizes can be produced using the drawdown method for most polymers.

Three or sometimes four pipe sizes can be produced with one tool set, which significantly reduces changeover time.

Easy handling

This means that the die parts are lightweight and the die is mounted horizontally, making changes easier and quicker.

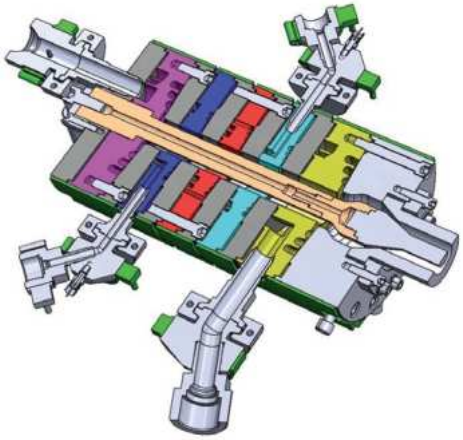
Pusher screws allow the die to be removed if there is already a low-temperature melt between the die and the mandrel. A low number of screws and easy cleaning are also important design criteria.

Low volume and small surfaces mean short residence times, leading to a short heat history for the material and short self-cleaning times.

Colour-striped rings/unit

Colour stripes are needed and can be co-extruded on top with a sharp border and as thin as possible. Common options include 3, 4, 6 or 8 stripes, sometimes double stripes or in different colours. There are many possible versions.

There are two options for installing the CSR or CSU (stripe ring or stripe unit). The CSU is designed for all sizes and is mounted after the basic head. The CCSR ring version is mounted at the end of the die. Both have advantages. The decision is made on a case-by-case basis.



Picture 14: 5 layer radial die

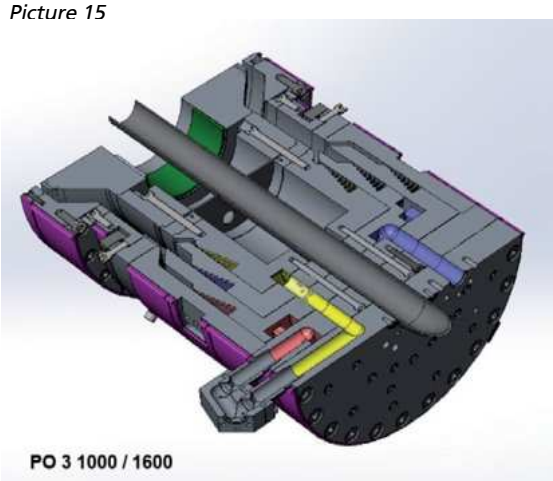
Pipehead solutions / examples

Monolayer heads

Attached is an example of an updated single-layer head design incorporating all these features. The head has a low volume, short premelt distribution and a helical spiral for a throughput of 1200 kg/h. It has a centring unit with a master die of 400 mm and a die set of 630 mm. It has internal head cooling by air and internal pipe cooling. The head is short in length and low in volume, and is suitable for 1200 kg/h with low heating power consumption.

For larger dimensions, especially for larger wall thicknesses, the wall swelling process is used, whereby the wall thickness is defined by compression, which reduces the

Picture 15



sagging effect. Large nozzles can be segmented to allow for different temperature zones along the nozzle circumference to generate thermic centring of the polymer flow.

For very large wall thicknesses, the melt cooler is used – the melt is cooled in the die head, increasing the viscosity and reducing sagging.

Picture 16: PO 1200 CR

Multilayer with radial spiral & helical spiral design

The applications of multilayer pipes are particularly diverse. Here are some examples: hot water and floor heating, non-pressure PP, sewer and waste (main layer compact, foamed or filled), water pressure, oil and gas, RTP, jacket for pre-insulated heat pipes and cable ducts with low friction, to name but a few.

The solutions for pipeheads for these applications are therefore also diverse and adapted accordingly. In addition to the standard spiral geometries mentioned earlier, there are two more for low-viscosity melts and technical polymers. With these 4 basic geometries, a multilayer pipe head can be designed for all possible pipe layer constructions.

An additional option is the radial helical distributor. This is essentially a flat helical spiral distributor. This geometry can be easily derived from the helical spiral. This construction is familiar from the Blown film and was first modified by CONEXTRU for pipes. This head is used for pipes up to 110 mm with 2 to 7 layers. It can be used as a single-layer addition up to a maximum of 10% of main layer up to 400 mm possible.

Multi Helical Spiral Heads have all the same mechanical, rheological and handling features as CONEXTRU's mono layer heads. The product line starts at 63 mm and goes up to 1600 mm, with 2 to 5 layers. In addition to barrier materials such as EVOH, there are also versions for high-temperature and chemically resistant technical polymers such as PA, PVDF, PPS and PSU.

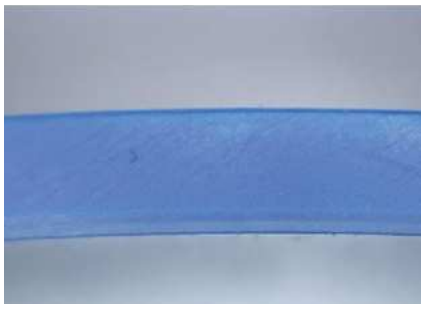
Monolayer cross heads

From the outset, CONEXTRU relied on the spiral distributor as the best solution for low pressure and precise melt distribution. The product programme of monolayer cross heads begins at 20 mm and currently ends with the largest head for the moulding of plastic or steel pipes at 1,200 mm. In principle, there is no upper limit. While throughputs up to 1,200 kg/h are required for steel pipe insulation, throughputs of up to a maximum of 400 kg/h and layer thicknesses of up to 5 mm are required for plastic pipe insulation. Additionally, there are features such as wire insertion or coloured stripes. These are usually protective layers made of PP.

CONEXTRU uses the same spiral distribution geometries for the


Picture 17: PO 250 CR

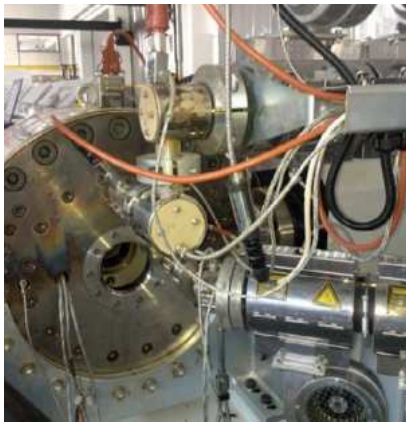

Picture 19: PO 44 400 CR IL EV



Picture 20: Cross section PE//Ad//EVOH layer Head PO 3 180 CR

mono- or multilayer heads as for the low- and high-output versions. The tolerances for layer thickness are excellent. There are two different types of coating: the pressure coating and the tube coating. Pressure coating is no longer common place due to its many disadvantages. Therefore, there is almost only tube coating, with which a large diameter range can be covered in the under drawing process. This means that in the smaller dimensions, four pipe diameters can be processed with one nozzle, while the range is smaller for pipe diameters over 630 mm. Similar considerations apply to the coating thickness and the nozzle gap. Typically, only a larger dimensioned gap is needed, which is then gradually reduced for thinner layers. The PO XX CR series (CR stands for Cross Head) has small increments, but thanks to the mechanical design, each head covers a large range. The PO 630 CR is used for the coating of pipes with a diameter of 630 to 90 mm. A special feature of CONEXTRU moulding

Picture 21: Crosshead for pipe in pipe making protection pipe 3 layer



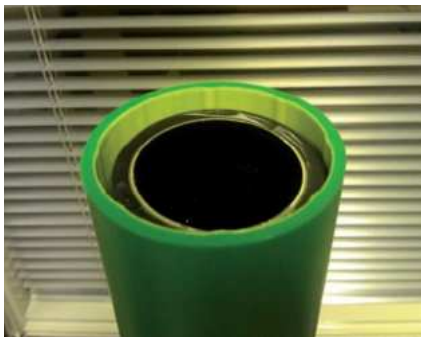
heads is the mounting of the mandrel and the nozzle – both from the front – in the moulding state. The position of the extruder can be realised according to customer requirements and can be mounted from the left or right at any angle, or from above. The head is fixed to the base, while the extruder is mounted on wheels to allow movement to accommodate length expansion and reduce tension. Under pressure is required for the tube coating process, which is generated via a small side channel compressor and regulated via PLC using motor speed. Small cross heads are used for bundling small pipes for optical fibre protection.

Multilayer cross heads

The applications of multi-layer coating heads are rare and are limited to the following areas:

Two-layer tools for steel pipe coating with primer and polyethylene, applying adhesive strips between PP and PE for improved adhesion and get easy peel ability, applying multilayer with barrier on drinking water pipes, underfloor heating pipes with coating of an oxygen barrier, jacketing pipes on PU-insulated pipes with barrier materials to reduce gas exchange keeping isolation properties, coating of high-filled barium sulphate to increase the sink ability of pipes and many others.

To distribute the melt (low- or high-viscosity & output) the tried-and-tested standard spiral distributors from CONEXTRU are used. An accurate distribution of the layers guaranteed also for this heads. For particularly thin layers, such as adhesion layers and for smaller pipe dimensions, the radial distributor is also used. As the use of multi-layer tools is limited, all these constructions designed so that they can easily be converted to mono-extrusion. An example of this is the PO 4 400 CR EVOH, which can be used as a single-, double- or 4-layer system with EVOH, either with PP or PP/Ad or PP/Ad/EVOH/Ad. The nozzle construction, design, vacuum control, sealing and assembly are identical



Picture 22: 4 layer fuel pipe with 3 layer protection pipe with ribs

to those of the mono crossheads. The PO XX CR EV IL series starts at 10 mm with each variant currently being a special order.

A special variant of Cross Head is used in the pipe-in-pipe production of fuel lines, where another multilayer pipe surrounds a pre-existing multi-layer pipe without touching it, as a protective pipe. In this case, the production of a 3 layer (PE/Adhesive/EVOH) protection pipe over a 4 layer PE pipe for fuel transportation in petrol stations:

Pipeheads with rotating mandrels and or dies

For special applications, pipes can have spiral ribs on the inside. For example: Vertical drainage pipes have spiral ribs on the inside to put the water into rotation. This allows it to flow faster with less noise. Similarly, cable protection pipes have spiral ribs to reduce friction. This is achieved by rotating the mandrel that creates these ribs.

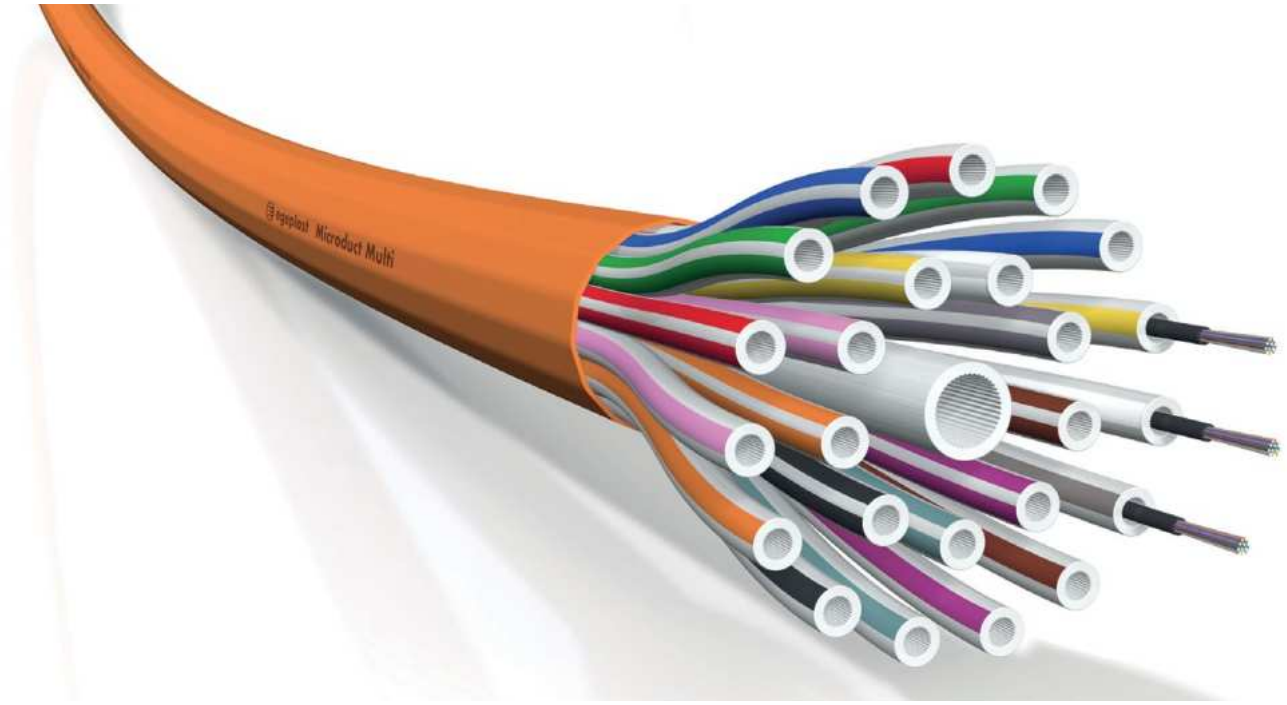
Summary

The trend of multilayer pipes will continue with new polymers and new applications, larger sizes. Especially technical polymers with high chemical resistance and high temperature use such as Fluoropolymers, PA, PPS, Polyketon and others. This trend requires flexibility in engineering and new individual design of pipeheads

By Josef Dobrowsky

CONEXTRU
Klosterstarsse 19, 3011 Irenental, Austria
Dobrowsky.j@conextru.eu

Fast Extrusion for Fast Communication

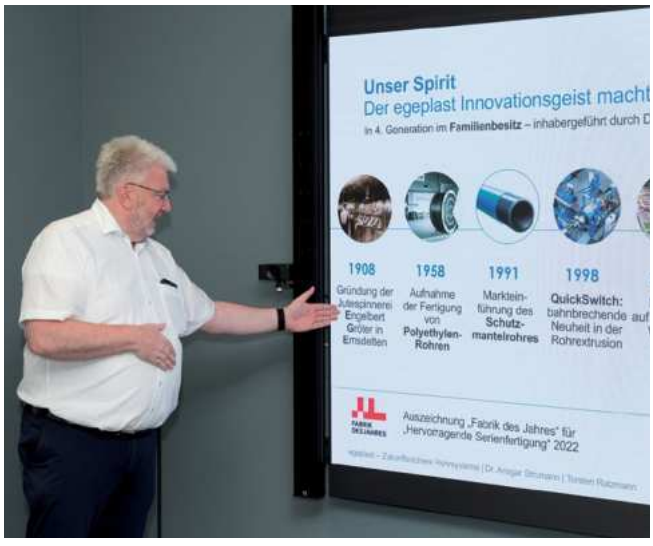


Around 2,000 metres of piping and a wealth of energy-efficient and intelligent technologies supply the extrusion lines at egeplast with plastic granules for the production of microducts and bundle pipes for fibre optic cable laying.

There are companies that, although little known outside the industry, have maintained their position as innovators for many years and whose products are used by almost every citizen. About ten kilometres north of the Westphalian city of Münster, in the middle of the countryside, highly innovative plastic products are being developed for the supply infrastructure in Germany and dozens of other countries: Drinking water, gas, electricity or sewage – their efficient and safe transport is the métier of the family-owned company egeplast. More than 60,000 tonnes of plastics are processed annually in 24/7 operation, some of which have very high requirements such as food safety and various types of certification. This also includes the highly varied production of protective pipes for fibre optics at the highest technical level.

egeplast has completely rebuilt its state-of-the-art production and assembly facility at its headquarters in Greven, covering an area of around 11,000 square metres on a greenfield site, with construction starting in autumn 2022. Series production started as planned in April 2024. Here, microducts of various diameters and colours are produced around the clock – pipes into which the individual glass fibres are later pulled or blown. They are combined into multi-pipe systems that are laid in the ground. Depending on customer requirements, the multi-ducts contain between six and 25 microducts of different diameters. The individual tubes have very tight tolerances of a few hundredths of a millimetre, and the outer casing of the

egeplast Managing Director Torsten Ratzmann already has his sights set on the next expansion phase of pipe production (Source: motan)



Two fully automatic Metrolink coupling stations draw material from 24 silos and distribute it to the extruders via almost 2,000 metres of piping (Source: motan)

multi-ducts must be robust and suitable for underground installation.

Automation and digitalisation of production and material flow

The heart of production consists of mono-extrusion lines with main, co- and colour extruders, which produce microducts in a wide range of colours and diameters, as well as two extruder lines, which coat the customised pipe bundles.

The automatic, central material supply and the fully automated warehouse for microduct spools make a significant contribution to the high efficiency and output of the entire plant. Material conveyance is an integral part of egeplast's production concept, but was developed and implemented as a stand-alone partial solution by the motan Group and integrated into the overall production process.

According to egeplast managers, the completely redesigned new production facility has succeeded in taking digitalisation and automation to a whole new level, thereby effectively counteracting the shortage of skilled workers in the border region between North Rhine-Westphalia and Lower Saxony. At the same time, it ensures that quality requirements are reliably met and that the very high variety of variants is mastered. This also applies in particular to the issue of material supply. 'Like other companies, we had the problem that when long-standing and experienced employees left, we were unable to find and train sufficient young talent quickly enough,' explains Managing Director Torsten Ratzmann. 'There were increasing difficulties in staffing continuous operations 24 hours a day, seven days a week with qualified employees.'

This raised the key question: how can the right material be transported safely and reliably from the silo to the machine? This automatically led to considerations such as 'automatic coupling of supply lines instead of manual coupling.' And, of course, the completely new material supply system offers many opportunities for reducing energy consumption and increasing material quality. It also opens up opportunities to relieve valuable employees of routine tasks and deploy them at the really critical points. 'Based on more than a year of operating experience with the new production system, I can already say,' says project manager Matthias Feldmann, "that we have roughly doubled output despite reducing the number of mono-extrusion lines and with considerably fewer staff. Now we can deploy our employees in an optimised manner," he emphasises. Another line was added in October 2025. And there is further potential for expansion, both in terms of extruders and in the materials logistics developed and implemented by motan.

egeplast has been using the Balance Score Card management tool for years. With the newly structured production, a significantly more transparent repre-

Fully automatic Metrolink coupling station (Source: motan)

Specially secured wall penetrations for material lines in fire protection walls (Source: motan)

Material lines run from the Metrolink stations to the intermediate containers on the second level above the extruders (Source: motan)

sentation of operational processes – and thus also of material logistics – has been achieved, enabling employees to respond quickly and effectively and avoid waste from the outset. 'This is urgently needed due to the enormous variety of products in terms of colours, number of single pipes in the finished cable bundle, lengths and other factors.'

Of course, there is still some waste, simply due to the start-up and shutdown of the extrusion process and the very frequent colour changes. 'But now we are in a better position to analyse the waste in detail,' explains Tobias Hallmann, Head of Global Industrial Engineering. 'Today, we know exactly how many metres of waste are produced under which circumstances and during which colour changes, and we can respond with appropriate optimisations.' In the past, such information was recorded manually in the MES (Manufacturing Execution System). This is now done more accurately and in real time. Today, data is recorded automatically and is also automatically available in the company-wide ERP (Enterprise Resource Planning) system. We have achieved significant reductions in waste here. 'We believe, and this has been confirmed to us repeatedly by suppliers and customers, that we operate the most modern production facility for microducts and bundle pipes,' says Torsten Ratzmann, who is convinced of the success of the investment. The award for Factory of the Year in the category 'Outstanding Transformation: Digitalisation & Automation' confirms this special achievement.

Central material supply from 24 silos

The safety and quality of the raw material – only polyethylene is used in microduct production – led to the decision to install the entire material storage facility indoors. Currently, 24 silos, each with a volume of 50 m³, are filled directly from trucks. Space is already available for a further twelve silos as an expansion option. The silos are connected to three fully automatic Metrolink coupling stations from motan, which supply the extrusion lines via a central vacuum system. As a special solution at egeplast, the three Metrolink distribution systems were permanently connected to a 'reverse' coupling station in order to combine the 24 (36) material sources with 13 (17) conveyors on the extruder. In addition to the special materials, which run as a mixture via the Gravicolor GC1000 dosing system from motan, or customer-supplied containers with regranulate, which can also be integrated. Typically, a few material feeding stations supply many processing machines, but here it is the other way around. At egeplast, up to 49 extraction points will be automatically and fail-safely connected to the extruders with 17 conveyors in the final configuration. The flexibility of the motan system and the control technology enables this unusual configuration without major technical effort.

To ensure the quality and installability of the glass fibres in the microducts, as well as optimal material utilisation, it is necessary to adhere to low diameter tolerances of typically 0.01 to 0.03 millimetres. Precise dosing technology with motan Minicolor and Gravicolor devices, as well as online measuring and control technology with BTW weigh hoppers from motan extrusion engineering on each extrusion line, reliably

Precise solution for egeplast: Dosing and mixing system with Minicolor G dosing device and BTW hopper scale (Source: motan)

ensure that quality parameters are maintained. This enables the material-saving and highly efficient extrusion of microducts and sheath pipes. This also includes the addition of colours and production and product-optimising additives. Here, too, a rather unusual but optimal combination of devices was developed for this application: the hopper scales measure the throughput gravimetrically, i.e. based on weight, and transmit the signal to the extruders or gravimetric dosing devices. This guarantees both cost-efficient and optimal feeding of the extruders with very low tolerances for the end products.

Almost 2,000 metres of piping for transporting granulate, mostly with a diameter of 60 millimetres, connect all plant components between silos and conveyor equipment at the extruders. Integrated into the system are dust extraction systems, comprehensive sensor technology and control and monitoring technology tailored precisely to egeplast's requirements, with interfaces to production management and ERP systems.

Efficiency, safety, competitiveness

Automation and digitalisation not only bring significant increases in efficiency, but also safety: it is now very easy to assign material batches to individual products. The motan control system automatically ensures that a production order is prioritised according to batch purity and that the silos are emptied, keyword 'fifo'.

„The extrusion lines are very durable and powerful, so we chose high-quality peripheral technologies to

Material supply via the extruders with Metro G conveyor devices and intermediate containers above the machine level (Source: motan)

match," explains Torsten Ratzmann. The central material supply system also has to cope with the wide variety of variants, which is actually atypical for pipe production, and that was a real challenge – especially since there were less than 18 months between the start and the actual operation of this large project, including the construction of the hall. What we have created here also serves as a blueprint for other plants in our group." In the process, solutions were developed on a large scale that are unique in the industry to date. There are no off-the-shelf systems here, but rather highly efficient systems precisely tailored to specific requirements – from material storage and central supply to the extrusion lines to the technology for winding the individual pipes and storing them in a fully automated warehouse. This relieves employees of routine tasks and makes better use of their qualifications.

Training in automation and programming is now carried out almost exclusively in-house. There is constant feedback between these employees and motan in order to gradually optimise organisation and production and guarantee the long-term competitiveness of the beautiful Münsterland region.

motan gmbh
Otto-Hahn-Str. 14, 61381 Friedrichsdorf, Germany
www.motan-group.com

egeplast international GmbH
Robert-Bosch-Str. 7, 48268 Greven, Germany
www.egeplast.de

Real-Time Measurement Reduces Scrap in Plastic Profiles

AI-Based Measurement Technology Integrated into the Production Process for Quality Control of Fiber Composite Profiles

A new measurement technology reduces scrap in fiber-reinforced plastic (FRP) profiles and enables cost-effective, real-time process control for small and medium-sized enterprises. Researchers developed the system in the PulLoop project led by the Fraunhofer Application Center for Optical Metrology and Surface Technologies AZOM. Together with Fraunhofer IGCV, the team developed an integrated measurement system that monitors product quality in real time during production and feeds the results back into the manufacturing process.

Fiber-reinforced plastic profiles serve as key components in lightweight construction. Manufacturers typically produce them using pultrusion, a process that offers cost advantages but often introduces quality uncertainties in practice, especially with changing profile geometries or small batch sizes. Fraunhofer AZOM contributes expertise in optical surface metrology and AI-based image analysis. The solution developed in the project, SURFinloop, uses low-cost scattering sensors that continuously record surface data and compares it with digital reference models known as digital twins. Modular software evaluates the data and detects geometric tolerance deviations with high precision. The system then feeds this information directly back into the production process in a closed loop.

Researchers developed an integrated measurement system in the PulLoop project that monitors product quality directly during production (All Pictures © Fraunhofer IGCV)

Conventional systems for quality monitoring in pultrusion are often too expensive or too complex to implement. SURFinloop targets the needs of small and medium-sized enterprises

Technology for Small and Medium-Sized Enterprises

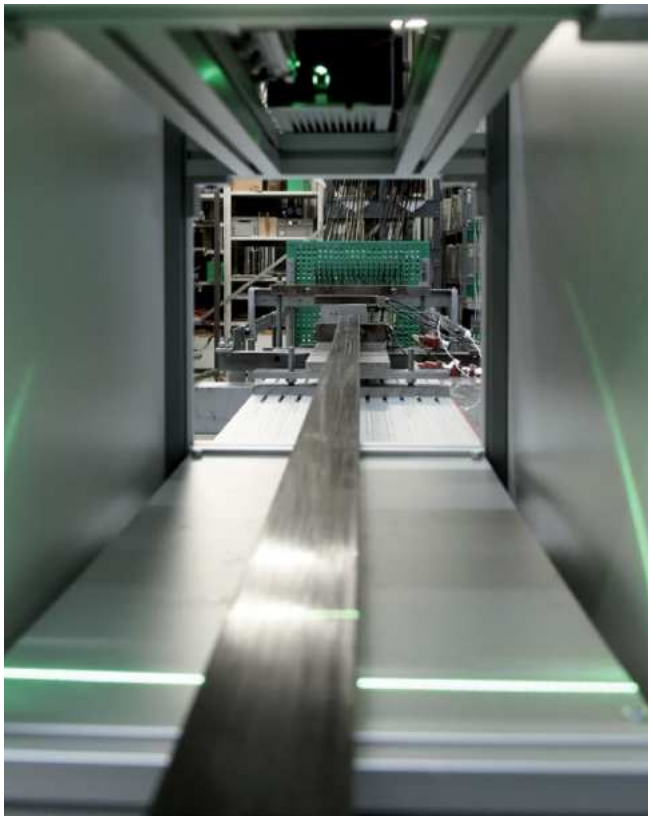
"Existing systems for quality monitoring in pultrusion are either too expensive or too complex to implement," explains Alexander Kabardiadi-Virkovski, project man-

ager at Fraunhofer AZOM. "SURFinloop addresses the needs of small and medium-sized enterprises." The demonstrator detects deviations of less than 100 micrometers at production speeds of up to two meters per minute. Training the software takes less than one hour. Companies can implement the measurement technology for only a few thousand euros per system – a decisive advantage in cost-sensitive industries such as automotive manufacturing or wind energy. The system adapts to different production lines and scales to a range of component geometries.

Synergy of Sensor Technology and Process Data Management

Fraunhofer IGCV contributes expertise in intelligent process data management and structured knowledge preparation for technology transfer to small and medium-sized enterprises. The partners aim not only to monitor production but also to stabilize and optimize it through systematic analysis and feedback. PulLoop demonstrates how digital production technologies and AI-based methods can become accessible to smaller companies.

Fraunhofer Institute for Material and Beam Technology IWS
Winterbergstr. 28, 01277 Dresden
www.iws.fraunhofer.de



Conventional systems for quality monitoring in pultrusion are often too expensive or too complex to implement. SURFinloop targets the needs of small and medium-sized enterprises

Precise Quality Monitoring in Cable Manufacturing

Founded in 1995 and headquartered in Bensenville, Illinois, Lake Cable is a leading US-based manufacturer of high-performance wire and cable. With a workforce of 650-plus employees, Lake Cable serves a wide range of markets including industrial automation, data centers, electric vehicles, smart infrastructure, and marine, oil, and gas industries – to name a few. At Lake Cable, delivering consistent product quality is non-negotiable.

"We manufacture highly engineered, high-tolerance products," explains Cooper Runzel, Chief Operating Officer at Lake Cable. "This demands real-time data collection and traceability for every foot of cable, which simply is not possible without quality inline measuring equipment."

To achieve such high standards, Lake Cable integrates SIKORA's advanced measurement equipment, such as the LUMP 2000, LASER Series, SPARK 2000, and CENTERVIEW 8000, directly into their extrusion lines. These devices are built to last and have become a staple in Lake Cable's production. SIKORA systems have also helped Lake Cable raise their automated quality process through improved data collection and communication protocols. "I have been in this industry for over a decade. I have used most of SIKORA's competitors, but no one has been a partner to us the way SIKORA has," says Cooper Runzel.

Such a close partnership is a key to Lake Cable's success, especially given its reputation as an industry leader and high expectations. Lake Cable uses a cell manufacturing model to provide the shortest lead times in the industry and a wide range of customization services – from jacket colors and striping to composite configurations and private labeling. Lake Cable's unmatched versatility is complemented by 100% quality inspections, small minimum runs, and traceability of all raw materials, machines, and operators.

All of Lake Cable's prime lines have one exceptional SIKORA measuring device installed: the CENTERVIEW 8000. Designed for smaller products such as data and automotive cables, Lake Cable uses the CENTERVIEW 8000 to show wall thickness and concentricity on a heads-up display. This system replaced the outdated method of cutting live samples for manual measurement and adjustment, reducing Lake Cable's start-up time and scrap. "By performing production checks on the fly, we save material and reduce the workload on our quality team," Cooper Runzel states, and adds: "Our customers, in turn, benefit from more consistent, high-quality cables with better centering, more uniform walls, and ultimately, greater satisfaction."

Lake Cable's vision for the future is clear to Cooper Runzel: "Our goal is to have a world-class, interconnected quality program – one that does not just respond to issues but anticipates them before they happen. SIKORA systems are a key part of making that vision a reality."

Lake Cable using SIKORA's CENTERVIEW 8000

SIKORA GmbH
Bruchweide 2, 28307 Bremen, Germany
www.sikora.net

#1-2026

RECYCLING

Regular Section
in EXTRUSION INTERNATIONAL Magazine

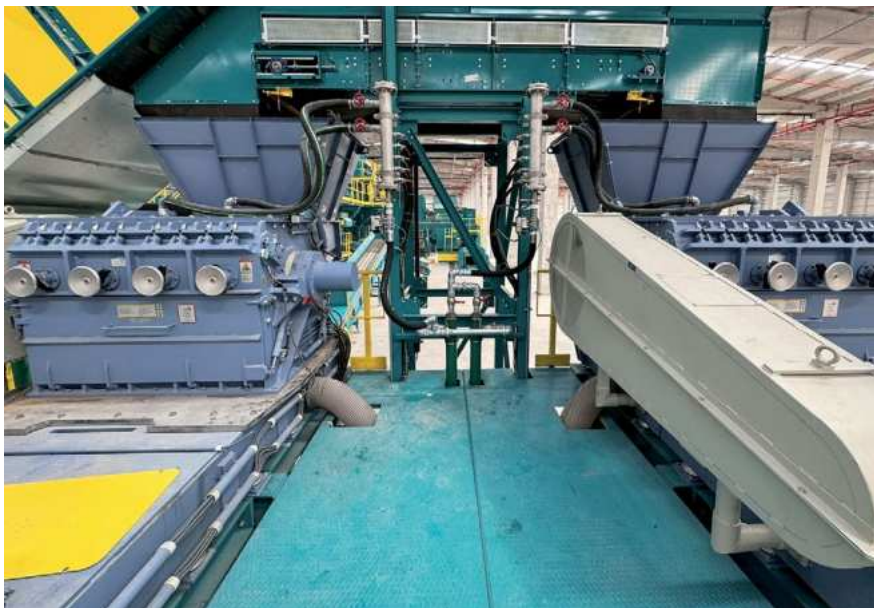
Second PET Washing Line Delivered in the Türkiye

Herbold Meckesheim, a specialist in machinery and system solutions for plastics recycling, has been commissioned by Turkish recycling company Doğa PET to deliver a second PET bottle washing line. The order follows the successful operation of the first washing line, which has been in continuous operation since the first quarter of 2024. With the new installation, Doğa PET will double its existing washing capacity at its recycling site in Kırklareli, Türkiye to produce a daily output of 200 metric tons of rPET flakes. The project underlines the confidence placed in Herbold Meckesheim as a system supplier and long-term technology partner for complex recycling applications.

The two SMS forced feeding granulators installed in the first line ensure uniform flake size and stable material intake, creating ideal conditions for downstream washing and density separation processes (Photos: Herbold Meckesheim, Germany)

Proven Performance Drives Expansion Decision

The first washing line supplied by Herbold Meckesheim has been producing high-quality rPET flakes for two years. According to the customer, stable operation and consistent output quality were the decisive factors behind the decision to invest in a second, technically identical system. The new line is designed with the same core process layout and throughput parameters as the existing line, ensuring reliable scalability and operational consistency and features key technologies such as forced feeding granulators, hot wash system in batch design, and hydrocyclone density separation. However, while the overall configuration of the new washing line corresponds with the proven design of the first plant, selected process modules have been optimized based on operational experience and variations in input material composition. A further improvement is the increase in presorting capacity to 8.0 t/h. To achieve this, Herbold is supplying a debaler and a washing drum that integrates both wet and dry sections into a single machine. These adjustments aim to further stabilize throughput and efficiency.



As a central process stage within the PET washing line, the hot wash system in batch design enables controlled temperature management and defined dwell times for efficient removal of labels, adhesives and organic residues

Herbold Meckesheim will support the project through all phases, from logistics coordination and on-site installation to system start-up and operator training.

"The first washing line has been running reliably since its commissioning and consistently delivers

The clean rPET flakes produced on the Herbold washing line stand for consistent quality and high purity, delivering rPET ready for high-value applications

the product quality we require," said Ömer Ayvacı, Chairman of the Board of the Doğa Group. "Based on this positive experience, it was a logical step for us to expand capacity with a second line from Herbold Meckesheim."

"Repeat orders like this confirm that our customers value not only our technology, but also our role as a dependable project partner," said Stefan Lachenmayer, Global Commercial Director Recycling and Managing Director Herbold Meckesheim. "The second washing line for Doğa PET demonstrates how scalable system concepts can support long-term growth in plastics recycling."

Herbold Meckesheim GmbH
Industriestr. 33, 74909 Meckesheim, Germany
www.herbold.com

Advancing Chemical Recycling

Borealis announced a strategic partnership with BlueAlp, a leading chemical recycling technology company headquartered in Eindhoven, the Netherlands. The partnership will see Borealis transfer its majority share in Renasci, a chemical recycling company based in Ostend, Belgium, to BlueAlp, while acquiring a 10% share in BlueAlp to support its future growth and scale-up.

Renasci licensed BlueAlp's technology to create a 20 kt p.a. scale-up plant, which BlueAlp engineered, constructed, and has supported throughout its operation in recent years. Moving from supporting operations to directly operating the asset is a logical next step in BlueAlp's growth. This will accelerate technology innovation, establish a robust platform for producing high-quality circular feedstock, and further strengthen BlueAlp's licensing proposition.

Since entering into Renasci, Borealis has led the development to become one of the few operating chemical recycling plants in Europe. Following the agreement, BlueAlp will lead the next phase of development and further advancement of Renasci, while Borealis continues to develop customer solutions based on chemically-recycled feedstock."Borealis' direct support comes at a pivotal moment in the chemical recycling industry, where rapid expansion of capacity is needed to achieve recycled content targets. Their market experience and materials expertise will support our growth and position us well to turn more plastic waste into high-quality circular feedstock," says Valentijn de Neve, BlueAlp CEO.

Renasci plant in Oostend, Belgium (Copyright: Renasci)

This collaboration helps Borealis and BlueAlp's customers and partners across the value chain to prepare for the EU's upcoming Packaging and Packaging Waste Regulation (PPWR) in 2030, which is expected to increase demand for recycled materials suitable for contact-sensitive applications like food and cosmetics packaging, such as those based on chemically recycled feedstock.

Borealis Group
www.borealisgroup.com

Recycling Meets Performance

BASF presented new materials, concepts and recycling methods for polyurethanes in footwear at SIMAC Tanning Tech. The leading international trade fair took place from September 23-25 in Milan, Italy. BASF showcased their unique and integrated toolbox of Elastopan® (PU) and thermoplastic polyurethanes Elastollan® and Infinergy®. Together with partners and customers the company brought innovative products to the market offering utmost lightness paired with mechanical performance and automated processing.

Circular economy is one of the major topics in all industries. The concept of meltable PU is an essential step forward towards a circular future of footwear: Bottom units, upper parts or even complete shoes made of meltable PU or combinations of TPU and PU are ready for mechanical recycling concepts. The new TPU Elastollan® RC with up to 100% recycled content can be used as a raw material for new shoe parts. Alongside this concept, the company is unveiling further strategies for circularity: by utilizing depolymerization, both post-industrial and post-consumer footwear waste can be incorporated into new polyurethane shoe soles. Alternatively, ChemCycling® enables us to achieve up to 100% attributed recycled feedstock by utilizing end-of-life tires or mixed plastic waste.

BASF
www.basf.com

Innovation, Integrated Engineering Expertise and Service Excellence

Recycling pioneer Lindner is exhibiting at IFAT Munich 2026 (4 to 7 May) and demonstrating its expertise in plant engineering. Visitors will also be able to see several product innovations in Hall B6/251 and in the outdoor exhibition area at FM/708/2. Centre stage is shared by the twin-shaft shredder launched in the autumn, Urraco Evo, and the mobile single-shaft shredder Merak 2800 with its new drive concept. The Micromat Series IV proves its versatility with a multicut rotor that makes light work of demanding materials such as Big Bags and textiles. An extensive range of services complete the portfolio along with the digital service platform Nexus, which provides real-time data and performance monitoring to ensure transparency, process reliability and maximum plant availability.

In line with its theme "Ready for the future of your business", renowned company Lindner will be at IFAT, focusing on future-oriented solutions that specifically align with current challenges in the sector. "The recycling sector is under enormous cost pressure: Rising energy prices, volatile raw material mar-

kets and higher recycling quotas increase the requirements on efficiency and cost-effectiveness. At the same time material flows are becoming more complex and there is a growing risk of fire from lithium ion batteries, which further tighten the requirements on process reliability and plant technology," says Matthias Egarter, CEO at Lindner. The recycling pioneer is facing these challenges with smart plant engineering and innovative shredder technology. Robust process parameters, consistent quality and reliable throughput are as much of a focus as high adaptability to materials and applications. Lindner draws on its technical experience from many years of working on complex recycling projects and on high-performance mechanical engineering that is Made in Austria.

The Merak 2800 is a powerful universal shredder for the most diverse materials and – depending on the application and screen configuration – makes it possible to produce defined output sizes from 30 to 120 mm. At IFAT, Lindner will be presenting the established shredder with its new drive concept that significantly expands the range of application (Picture: Lindner

Sustainable circular economy

At IFAT Munich, Lindner will show how modern recycling plants produce high-quality, marketable reusable fractions from complex waste streams. As a pioneer in recycling, Lindner's engineering can be found in powerful stand-alone machines, which it combines with solutions that incorporate every stage of the process from planning to commercially robust plant operation. "We take over once waste collection is complete," says Marco Egger, Managing Director of Lindner's Systems Engineering Division. "Our goal is to take heterogeneous waste and produce clearly defined, quality-assured material streams as clean fractions are a pre-requisite for high-quality recycling," says Egger. "Using tailored sorting and plant concepts we create the conditions for consistently high-quality products, whether these are used for plastics recycling or for other demanding recycling paths. This is how mixed waste is used to produce high-grade raw materials that are systematically fed back into recycling processes and reintegrated in the product loop." The company's services cover the entire project cycle from consulting and engineering to technical implementation with controlled risk minimisation to commissioning and servicing.

In plastics recycling, Lindner focuses on comprehensive systems that combine engineering, shredding, sorting and washing. Its international project and process expertise is evidenced by more than 200 washing plants and components that have been installed worldwide. The technology partnership between Lindner Washtech and the extruder manufacturer EREMA – coexhibiting with Lindner at IFAT – also means that the extrusion process is integrated smoothly. This creates complete solutions from the feedstock to the final recyclate – which can be delivered as food grade quality. The core value proposition is also in the consistent optimisation of all process steps along the entire added value chain.

New products at IFAT 2026

At IFAT in Munich, Lindner will also be showcasing its latest product innovations in shredding technology. After the official launch last year, the new Urraco Evo series will be presented to a broader audience at IFAT. The mobile twin-shaft shredder was specifically developed for demanding heavy-duty applications and combines impressive power, a quick-change function and Lindner's proven shaft versatility. In addition to wood, domestic and commercial waste as well as plastics, there is a conscious focus on applications such as scrap metal, mixed scrap and aluminium. Visitors can see the Urraco Evo at Lindner's outdoor exhibition space FM/708/2 and in action as part of the VDMA demonstration days (VDMA Praxistage). There will also be a demonstration of the Merak 2800. Not the established model with its electric drive but an additional Merak series with a new drive concept.

Lindner will also present another new product in Munich – the fourth generation of its Micromat series.

The heart of this series is a synchronous reluctance motor that achieves an energy efficiency class of IE6, offering more than 97 % efficiency while using no rare earth metals. In shredding news, the new multicut rotor enables flexible operation for a wide range of materials – from plastic, wood, commercial and domestic waste to textiles – and reduces maintenance effort and downtime thanks to its rapid-change knife system.

Integrated recycling solutions

As the leading trade fair for environmental technologies, IFAT 2026 is dominated by innovation, sustain-

ability and future-proof solutions for the water, waste and recycling industries. This is exactly in line with Lindner's focus. "Business owners worldwide are tasked with making sure their plants run as economically and safely as possible while ensuring they are also fit for the future. By means of our tailored recycling solutions, we can support them to sustainably optimise their processes and efficiently bring materials back into the loop."

says Egarter. "Using our expertise, we offer innovative and reliable individual and complete solutions that ensure our customers remain competitive in light of rising regulatory and economic requirements, and help them sustainably close material loops. Our mission is to work with our customers to implement concepts that are both commercially successful and environmentally viable."

These solutions have stood the test of time, a fact that is reiterated by the company's service division:

"Lindner machines have been synonymous with reliable performance for nearly 80 years – even under the most demanding conditions and in some cases operating for more than 200,000 hours. The decisive factors that make this possible start with quality-assured manufacturing and continuous further development but also include professional maintenance, collaborative service and specific retrofitting and upgrade solutions along the entire life cycle. Our digital service platform, Nexus, also means we can use the digital intelligence of our machines for performance monitoring and first-level support, offering additional process reliability," says Hubert Graf, Head of Service.

Lindner-Recyclingtech GmbH
www.lindner.com
Lindner at IFAT: Halle B6/251

Partners to Scale Tray-to-Tray Recycling in Europe

Sulayr Recycling, based in Granada, Spain, has strengthened its transparent-to-transparent, tray-to-tray PET recycling operations by integrating advanced sorting solutions from TOMRA Recycling. Specializing in complex and multilayer thermoformed PET trays, Sulayr transforms post-consumer material into new food-grade trays with full traceability. By optimizing its sorting infrastructure, Sulayr is establishing a stable and scalable model for circular PET packaging in Europe.

The AUTOSORT™, a multifunctional NIR sorting allrounder, plays a critical role in handling the complexity of the input material

Recycling PET trays at scale is one of the most demanding challenges in plastics recycling. The combination of complex structures, mixed input streams and strict quality requirements leaves little margin for error – particularly when the objective is to turn post-consumer trays back into new food trays. More than five million tons of PET packaging enter the European market annually. While bottle-to-bottle recycling is already well established, PET trays – representing roughly 25% of this volume – remain a vast untapped resource. Scaling tray-to-tray recycling is therefore both a technical challenge and a strategic imperative for advancing circularity in PET packaging. This is precisely where Sulayr Recycling focuses its expertise.

Day by day, the company is building a recycling model that is unique in the world and based on real circularity: keeping transparent PET trays in a closed loop and returning them to the market as new, food-grade trays. This transparent-to-transparent, tray-to-tray recycling approach for complex, multilayer thermoformed PET trays is the strategic backbone of Sulayr's operations, ensuring full traceability and food-grade compliance.

Currently serving over 100 customers across Europe, Sulayr produced more than 50,000 tons of recycled PET in 2025 alone – equivalent to a production capacity of over four million trays per day.

To maintain this momentum on an industrial scale while meeting increasingly strict market and regulatory demands, Sulayr recognized the need to further enhance process stability and sorting precision. This led the company to seek a technology partner capable of supporting its next phase of growth.

A challenging input amid rising expectations

The material Sulayr processes is primarily sourced from post-consumer PET tray streams via Extended Producer Responsibility (EPR) systems. Depending on its origin and the time of year, this input material varies significantly and often includes other PET types, multilayer structures and polymer contaminants.

The result of this integrated setup is consistently high and stable purity levels above 99.8% under real operating conditions, enabling reuse in food-grade applications

"As quality requirements evolved, stability became just as critical as purity," explains Sergio Collado, Chief Technology Officer at Sulayr. "For tray-to-tray applications, you need a process that delivers consistent results every single day – not just under ideal conditions."

A shared responsibility for results

To achieve this level of consistency, Sulayr engaged TOMRA Recycling as a strategic partner to co-design and optimize the sorting process.

TOMRA's involvement went far beyond equipment selection: they provided expert consultancy on optimal machine positioning and the essential pre-treatment steps required to ensure material reaches the sorting units in peak condition. The objective was to engineer a stable, scalable process architecture rather than simply installing standalone machines.

"This was far from a standard supplier relationship," says Jesús Espinar, Area Sales Manager at TOMRA Recycling. "We collaborated closely with Sulayr to align with their targets, material characteristics and operational constraints. Our shared responsibility was to design a process that performs reliably and consistently delivers the high quality required by current European regulatory standards, while providing the flexibility to adapt as those requirements become even more stringent in the future."

Technology integrated into the process

The core of the solution is a dual-track AUTOSORT™ and an INNOSORT™ FLAKE system, both fully integrated into Sulayr's industrial configuration. The process chain incorporates material reception, optical sorting at tray level, washing, grinding, flake purification and final extrusion into tray-grade rPET.

At the tray level, the dual-track AUTOSORT™ – a multifunctional sorting allrounder – is critical for managing the high complexity of the input material. Its unique configuration enables two independent sorting steps within a single unit. In the first track, PET Clear/Light Blue (CLB) is positively ejected from the mixed stream. In the second track,

INNOSORT™ FLAKE detects flakes by polymer type, color and transparency in a single sorting step, ensuring precise separation even at small particle sizes

the remaining non-target materials are removed through negative sorting, where contaminants are ejected to leave a high-purity final product. This combination maximizes both recovery and final purity while maintaining high throughput.

The ability of the AUTOSORT™ to reliably detect and separate monolayer and multilayer PET trays – even within highly mixed streams – makes it uniquely suited for demanding tray-to-tray applications where precision and long-term stability are non-negotiable.

Following shredding, the INNOSORT™ FLAKE performs the final purification step to secure the needed critical quality levels required for food-grade applications. The system detects flakes by polymer type, color and transparency in a single sorting step, ensuring precise separation even at small particle sizes.

The unit's multi-stage configuration enables sequential purification steps, while a dedicated recovery stage allows any valuable PET still present in the rejected fractions to be reintroduced into the process. This recirculation logic maximizes overall yield and supports economic efficiency.

The result of this integrated setup is consistently high and stable purity levels above 99.8% under real operating conditions. This enables immediate reuse in food-grade applications and supports Sulayr's goal of transparent tray-to-tray recycling. The quality achieved is comparable to virgin material, reducing dependence on primary PET and enabling converters to meet demanding recycled-content requirements without compromising functionality.

Operational impact and strategic partnership

At the same time, material recovery has increased and the volume of rejects has been reduced, further strengthening both quality and operational profitability. While the primary target fraction remains transparent PET trays, certain colored tray fractions can also be valorized depending on market demand and customer specifications, adding significant flexibility to Sulayr's industrial model.

"What made the difference was how closely we worked together with TOMRA during integration," says Antonio Jesús Marcos, Head of Marketing at Sulayr. "It was not just about installing equipment. We aligned on process details, performance targets and long-term stability. The focus was always on results under real operating conditions, rather than on theoretical figures."

Stability that enables commercial growth

The increased stability of output quality has allowed Sulayr to meet stricter customer specifications and access new customer segments. This includes converters and packaging producers requiring certified, traceable recycled content for food-grade trays across multiple European markets. This consistency paves the way for higher value-added applications and strengthens Sulayr's position as a reliable strategic supplier in a tightly regulated environment, where long-term supply security and documented compliance are increasingly decisive.

A reference for scaling real circularity

As pressure grows to recycle more complex packaging formats, PET trays are becoming a key focus across Europe. The Sulayr project demonstrates that advanced sorting technology, combined with close collaboration and shared operational responsibility, can make tray-to-tray recycling of complex PET streams viable on an industrial scale. Beyond the technical solution, the partnership has unlocked new business opportunities and strengthened Sulayr's position in an increasingly demanding market.

"Advanced technology is essential," says Jesús Espinar. "But what really makes projects like this work is the partnership approach. When strong partners bring their combined expertise to the table and work closely together, tray-to-tray recycling can be scaled reliably. This benchmark process for the recycling industry is definitive proof of that."

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