

K-PROFI

international edition



Gerflor Mipolam in Troisdorf manufactures PVC floor coverings for large-scale projects. A virtual production assistant coordinates the manufacturing process, improves plant efficiency and identifies potential savings.

Our quality promise to plastics processors

- › Trendsetting know-how
- › Success stories from Europe
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Help from the virtual production assistant

How **SLB** sheaths cables for oil rigs. How **fhw-moulds** makes oil canisters 25% lighter. How **Wirthwein** is scaling up hybrid injection moulding. How **Handtmann** is embracing large-format 3D printing. What **Swissplast** hopes to gain from k-tec. And how **LH-Plastics** processes PIR and PCR-PE for 15 µm thin films.

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Stamina is key

Dear reader,

The war in the Gulf is causing quite a stir in the plastics industry. All we can do is pursue the right strategy on the ground, optimise processes and capitalise on opportunities.

Two years ago, the Handtmann Group acquired 3D printing pioneer Kegelmann. It is now entering the large-format 3D printing market. Sabine Rahner spoke to Markus Albrecht about the technology and market potential: page 6. Kilometres of cable used in oil production must withstand cold, heat, salt water and storms, as well as fluctuating pressures. Gabriele Rzepka reports on the complex sheathing process at the French SLB plant in Abbeville from page 8. Thanks to a new product and mould design, fhw-moulds has reduced the weight of extrusion blow-moulded oil canisters for Exxon Mobil by 25%, as Karin Regel reports from page 10. The Swiss plastics market appears largely stable, as demonstrated by the "Swiss Plastics Expo" in Lucerne, where the range of products on offer remained virtually unchanged. Some impressions from the trade fair on page 13.

Wirthwein has designed the series production of mounting brackets and various multifunctional brackets with adjustable cooling air inlets, built a new production hall and ramped up a fully automated production line: page 14. The Swiss thermoforming company Swissplast Group, based in Sargans, acquired k-tec in Radstadt, Austria, at the start of 2026. Gabriele Rzepka asked what the new CEO, Ninyan Bieri, hopes to achieve from the acquisition of the specialist in transparent thermoformed parts: Page 18. Gerflor Mipolam manufactures PVC floor coverings for large-scale projects in Troisdorf. Karin Regel looked at how a virtual production assistant identifies potential



savings, provides targeted information to staff and boosts plant efficiency: Page 22. The recycle manufacturer LH Plastics in Werdau specialises in processing PIR and PCR film waste from PE. Films up to 15 µm thick can be produced from its recyclates. Robby Beckert and Heinz-Henning Seute gave Karin Regel an insight: Page 26.

Whatever the odds, we wish you every success!

Markus Lüling

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Cover photo: Gerflor



Photo: Wirthwein

Wirthwein has ramped up series production in Creglingen of mounting brackets and various multi-functional brackets with adjustable cooling air inlets (see article on page 14). K-PROFI visited the project team.

Trade Fair Calendar

Trade fairs related to plastics processing in 2026

All information without guarantee. Short-term cancellations or postponements are possible at any time.

Wire, Tube	Dusseldorf, Germany	13.04. – 17.04.2026	www.wire.de ; www.tube.de
Utech Europe	Maastricht, The Netherlands	20.04. – 22.04.2026	www.utecheurope.eu
Hannover Messe	Hanover, Germany	20.04. – 24.04.2026	www.hannovermesse.com
Chinaplas	Shanghai, China	21.04. – 24.04.2026	www.chinaplasonline.com
Plastteknik Nordic	Malmö, Sweden	22.04. – 23.04.2026	www.plasttekniknordic.com
MedTec live/T4M	Stuttgart, Germany	05.05. – 07.05.2026	www.medteclive.com
Plastics Recycling Show Europe	Amsterdam, The Netherlands	05.05. – 06.05.2026	www.prseventeurope.com
Recycling and Compounding Expo	Mumbai, India	06.05. – 08.05.2026	www.raceexpos.com
Interpack	Dusseldorf, Germany	07.05. – 13.05.2026	www.interpack.com
Plastics & Rubber Thailand	Bangkok, Thailand	13.05. – 16.05.2026	www.plasticsrubberthailand.com
Plastpol	Kielce, Poland	19.05. – 22.05.2026	www.targikielce.pl/en/plastpol
Interplas	Birmingham, UK	02.06. – 04.06.2026	www.interplasuk.com
FIP 2026	Lyon, France	02.06. – 05.06.2026	www.f-i-p.com
Equiplast	Barcelona, Spain	02.06. – 05.06.2026	www.equiplast.com
HanoiPlas	Hanoi, Vietnam	03.06. – 06.06.2026	www.chanchao.com.tw/hanoiplas
KPA, Kuteno	Bad Salzufen, Germany	09.06. – 11.06.2026	www.kpa-messe.de ; www.kuteno.de
Plast	Milan, Italy	09.06. – 12.06.2026	www.plastonline.org
Plastics Recycling Show Asia	Singapore	17.06. – 18.06.2026	www.prseventasia.com
Expo Plast Peru	Lima, Peru	19.08. – 21.08.2026	www.expoplastperu.com
Vietnamplas	Ho Chi Minh City, Vietnam	09.09. – 12.09.2026	www.chanchao.com.tw/vietnamplas
Taipei Plas	Taipei, Taiwan	15.09. – 19.09.2026	www.taipeiplas.com.tw
KPA	Schkeuditz (Leipzig), Germany	16.09. – 17.09.2026	www.kpa-messe.de
Kunststoffenbeurs	's-Hertogenbosch, The Netherl.	16.09. – 17.09.2026	www.kunststoffenbeurs.nl
ColombiaPlast	Bogota, Colombia	21.09. – 25.09.2026	www.colombiaplast.org
Compounding World Expo	Frankfurt, Germany	23.09. – 24.09.2026	eu.compoundingworldexpo.com
Plastics Recycling World Expo	Frankfurt, Germany	23.09. – 24.09.2026	eu.plasticsrecyclingworldexpo.com
Plastics Recycling Show ME&A	Dubai, UAE	28.09. – 30.09.2026	www.prseventmea.com
Powtech	Nuremberg, Germany	29.09. – 01.10.2026	www.powtech.de
PackPrintPlas Philippines	Manila, Philippines	08.10. – 10.10.2026	www.k-online.com/en/k-alliance
Fakuma	Friedrichshafen, Germany	12.10. – 16.10.2026	www.fakuma-messe.de
Utech Asia/PU China	Shanghai, China	03.11. – 05.11.2026	www.puchina.eu
Plast Imagen	Mexico City, Mexico	10.11. – 13.11.2026	www.plastimagen.com.mx/en
Interpack China	Shanghai, China	16.11. – 18.11.2026	www.interpack-cn.com/en
Compamed	Dusseldorf, Germany	16.11. – 19.11.2026	www.compamed.de
Formnext	Frankfurt/Main, Germany	17.11. – 20.11.2026	www.formnext.de
Plastics and Rubber Indonesia	Jakarta, Indonesia	18.11. – 21.11.2026	www.plasticsandrubberindonesia.com
SPS	Nuremberg, Germany	24.11. – 26.11.2026	sps.mesago.com
IPF Japan	Chiba, Japan	01.12. – 05.12.2026	www.ipfjapan.jp
Plastics Live Ireland	Athlone, Ireland	02.12. – 03.12.2026	www.plasticlive.ie
PlastEurasia	Istanbul, Turkey	02.12. – 05.12.2026	www.plasteurasia.com

“Large-format printing opens up new markets”

How Handtmann is further expanding its centre of excellence for additive manufacturing

Two years ago, the Handtmann Group, based in Biberach, integrated the 3D printing pioneer Kegelmann, based in Rodgau, into its plastics technology division and has been driving additive manufacturing forward ever since. The latest milestone is the move into large-format 3D printing with investment in, among other things, a granulate printer that can produce large-volume components measuring up to 1,05 m × 1,05 m × 1,7 m. K-PROFI spoke to Markus Albrecht, Head of Additive Manufacturing, about the expansion of the 3D printing competence centre at the Rodgau site.

Text: Dipl.-Ing. (FH) Sabine Rahner, Editor K-PROFI

Handtmann Elteka is the nucleus of the plastics technology division of the Handtmann Group. The high-performance material that is the focus of everything here is called Lauramid, a PA12 polymerised from laurilactam. The article “Make it thick, no problem” in K-PROFI 6/2025 (in German directly available at www.k-profi.de/heft/250606) describes how Handtmann uses polyamide to produce large components in solid plastic casting and mechanically processes pressureless cast semi-finished products. Handtmann also developed an injection-mouldable reggranulate from the Lauramid chips produced during machining. Lauramid Inject is processed in injection moulding and turned into PA12 filaments for 3D printing.

With the acquisition of the injection moulding and 3D printing company Kegelmann at the beginning of 2024, Handtmann strengthened its expertise in the field of additive manufacturing. Kegelmann had already invested in their first stereolithography system in 1989 and their first laser sintering system in 1994, and had been steadily expanding their additive manufacturing capabilities ever since. Tool-making and injection moulding followed in 1998.

The Queen 1 granulate-based extrusion printer prints large-volume components up to 1.05 m × 1.05 m × 1.7 m. Here, Handtmann can process all thermoplastic granulates that are also used in injection moulding.

K-PROFI: Mr Albrecht, how important is 3D printing within the Handtmann Group?

Markus Albrecht: Additive manufacturing is the cornerstone of our company and continues to play a very important role. At our Rodgau site alone, we generate around a third of our turnover with these technologies. The sector continues to grow. Within the Handtmann Group, we are the centre of excellence for 3D printing.

Which user industries do you focus on with your offering?

The automotive sector accounts for around 40 per cent. We do a lot of work for special machine construction. Our strongest customers are packaging machine manufacturers. In medical technology, our speciality is orthoses and prostheses, a large and growing market. We print for almost all parts of the body, for initial treatment in accidents, sports injuries or even for the correction of malpositions in children. This is where 3D printing comes in. By scanning the body parts close to their contours, the orthopaedic technician obtains precisely fitting and lightweight parts. We process important orders for hospital care overnight.

So, you print highly functional and technical components?

Exactly. We also build prototypes, but most applications are series parts, even if the series means a quantity of one, as is the case with orthoses. We generally do not differentiate in terms of quality standards. Whether

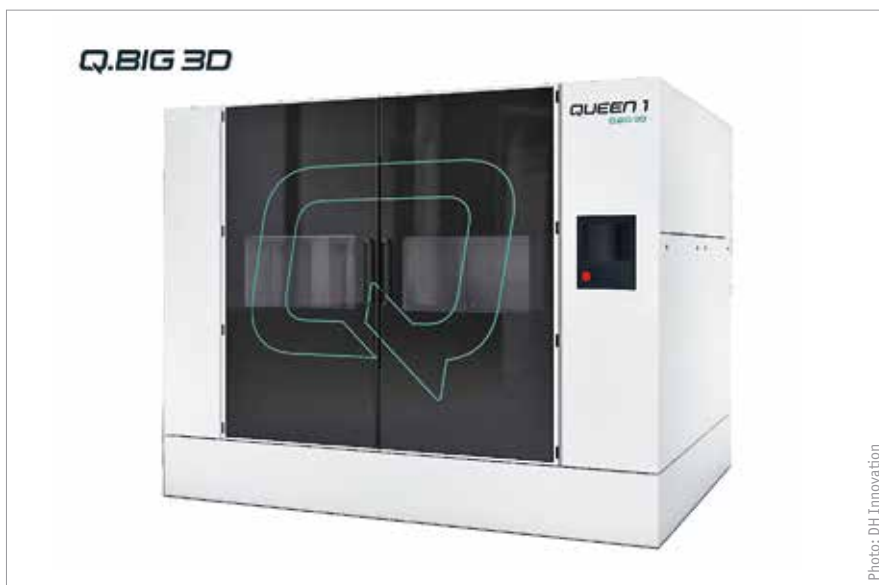


Photo: DH Innovation



it's a prototype or a series, we print test specimens and tension rods at the same time with every build job. Thanks to our own measurement technology here on site, we always have an eye on the parameters and can react quickly in the event of deviations. In addition, a machine technician ensures that all machines are available 24/7, which is essential for patient care in particular.

How are you set up? What technologies do you master?

We currently operate seven selective laser sintering systems for plastic components, one stereolithography system, one multijet fusion system and five FDM systems for filament printing. We process stainless steel using an SLM system – i.e. selective laser melting. We also have an extended workbench for printing aluminium, and within the Handtmann Group we have access to 3D printing of tool steel; there is even a sand 3D printer at the Biberach site.

You are continuing to expand the 3D printing competence centre in Rodgau. What are your plans?

At the beginning of 2026, two new products will be added to our portfolio. The first is an HT601P-2 powder bed fusion (PBF) system with dual lasers for PA 12, PA11 and PA6 from the Chinese manufacturer Farsoon. This new product, which was unveiled at the Formnext 2025 trade fair, has a cubic build space with an edge length of 600 mm, thereby expanding our capabilities in large-format printing using powder-based processes. The largest build spaces of existing laser sintering systems from 3D Systems are 500 mm × 500 mm × 750 mm. We operate the new system in conjunction with our PA12 central supply because we see a high demand in the market for large-volume components made of PA12.

Even larger is the build space of the Queen 1 from Q.BIG 3D by DH Innovation in Aalen, our second new product. With 1,050 mm × 1,050 mm × 1,700 mm, you can print really large parts. It is a granulate-based extrusion printer with variable nozzle opening, which prints in high resolution where necessary and can work with thicker

Department manager
Markus Albrecht:

"At our Rodgau site, we are investing in state-of-the-art equipment, broadening our portfolio with large-format printing and further expanding our concentrated expertise in additive manufacturing so that we remain competitive."

paths in turbo mode. The maximum nozzle temperature is 350 °C. We can process all thermoplastic granulates that we also use in injection moulding. All that is required is to enter the parameter sets. This opens up a very wide range of materials.

Does this also apply to Handtmann's Lauramid material?

We have already determined the appropriate parameters for Lauramid. The fact that we can also process our own Lauramid PA12 reggranulate with the Queen 1 is a huge advantage. The material has exceptional properties in terms of impact strength, low water absorption and chemical resistance that other granulates do not have. This opens up completely new markets in 3D printing.

What are the expectations you have for entering the XXL large-format printing market?

It wasn't just the recent Formnext 2025 trade fair that showed that a market for large-format printed parts is currently developing. Being able to offer our customers solutions right from the start is a strategically important aspect. Possible applications include maritime applications, components for building services engineering, cladding, aids such as formwork with channels for vacuum casting, or even large air ducts for special or agricultural machinery construction – especially with regard to the supply of spare parts for older systems, lightweight construction with bionic structures and many other possible applications. I am convinced that markets will open up that we cannot even imagine at present. ■

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View inside an Excelitas IR tube furnace.

Photo: Excelitas

Plastic sheathing for extreme conditions

How SLB protects kilometres of cable used in oil production in aggressive environments

Cables are an indispensable part of oil production. The demands placed on them are high, as they must withstand extreme environmental influences such as cold, heat, salt water and storms. In addition to the harsh environmental conditions, they must also withstand heavy loads. They are typically exposed to temperatures of over 150 °C, very high pressures of more than 690 bar and repeated stress cycles, as is typical when lowering equipment weighing up to several tonnes into oil wells. Substances such as hydrogen sulphide are highly corrosive and also attack the cables. The manufacture of the cables is correspondingly complex. At its plant in Abbeville in northern France, SLB employs around 200 people to manufacture precisely this type of cable.

Text: Dipl.-Ing. Gabriele Rzepka, Editor K-PROFI

Today, SLB N.V. is the largest oil exploration and oilfield services company, headquartered in Willemstad on the Dutch island of Curaçao and with operational headquarters in Paris, Houston, The Hague and London. The success story began in Paris in 1926, when brothers Conrad and Marcel Schlumberger founded their company Société de Prospection Électrique. Their business model was based on a geophysical survey method they had developed that measures the electrical resistance and conductivity of soils – electrical prospecting. The Schlumberger brothers expanded this method to locate oil deposits. The company thus evolved from a former geoelectric surveying business into a global oilfield services provider. Today, the global corporation employs around 100,000 people worldwide and generated sales of just under EUR 33 billion in the 2024 financial year.

Shrink-fitting in the IR oven

Gabriel Cuvelier, an engineer at the Abbeville plant, describes how the company meets the challenges that the cables have to withstand: “We use special polymers to protect our cables from the harsh environmental conditions in oil wells. We sell the cables worldwide for use in oil and gas wells for various tasks. Due to the acidic atmosphere and high corrosion load, we have to ensure complete

protection for our cables.” The cables can be up to 10 km long and weigh several tonnes, depending on their diameter and the material used. But no matter how long or thick a cable is, it is always protected by a plastic sheath. “The thickness of the plastic sheath varies from just under 10 mm to less than a tenth of a millimetre. So it is thin compared to the overall diameter, but it fulfils its purpose completely,” Cuvelier explains.

The cable cores are usually made of copper and insulating materials. The company shrinks the plastic sheath onto the cables in a Noblelight infrared oven from Excelitas. Heating it close to its melting point under tension causes the plastic sheath to adapt to the cavities on the outer surface of the cable and form a homogeneous protective layer. The heat input must be precisely correct. If the cable is heated just a few degrees too much or remains in the IR oven for just a second too long, it can ruin the entire product. Cuvelier explains why: “If the insulation of the core conductor inside the cable begins to melt due to prolonged exposure to IR heating, this means that the current flow and electrical connection in the cable are interrupted. Therefore, the customised integration of the IR oven into the production line was absolutely essential. As a team, we are proud to have successfully mastered this challenge.”



Photo: SLB

The plastic sheath is shrunk onto the copper cable core and insulating material in the IR furnace.

The temperature and throughput speed of the cable through the IR oven are constantly monitored.



Photo: SLB

Cuvelier's team carried out numerous measurements to determine the optimum heat input from the infrared radiation. To do this, the experts launched a measurement campaign with sophisticated measurement series to determine the effects of IR heating on the cables and the optimum process and oven settings. "We saw that a deviation of 5 °C already leads to significant differences in cable quality," explains Cuvelier.

Integration into production line

The IR furnace is now fully integrated into the production line. The cables pass through the oven at a speed defined in advance by measurements and remain there for only a few seconds so that the surface temperature rises to the predetermined values. This type of heating ensures that only the surfaces of the cables are heated and not the underlying layers or conductors, which must be protected from high temperatures. Integration into the line enables SLB to log and centrally document all data relating to the entire line operation. The biggest challenge in integration is establishing communication between the production line and the IR oven. Both must stop simultaneously when necessary to prevent the cable from overheating due to excessive heat exposure or being processed without sufficient heating.

According to Cuvelier, Excelitas tailored the oven to SLB's needs: "We needed an IR oven with high-quality IR emitters and, in addition, a very safe system with first-class build quality. The oven also had to fit into our two

production lines, where it is used in different stages of the process. The IR oven has already proven itself in this regard." The advantages of the IR oven are obvious. In a short time and in a small space, SLB is able to continuously shrink the sheathing onto the cables without moving parts or contact with the cable over the very long lengths typical of borehole cables. The IR ovens score points with their high reproducibility of production parameters. Cuvelier sums it up: "Since it was installed, the oven has been working precisely and without fluctuations."

The charm of IR technology

Infrared heating technology works by transmitting electromagnetic waves that generate heat in the product. This does not require a transmission medium such as air or gas – nor does it require direct contact with the material. Compared to air, which has a maximum heat transfer capacity of around 40 kW/m², infrared radiation has a capacity of up to 1 MW/m².

Part of the electromagnetic radiation is absorbed by the material, while part is reflected. Only the absorbed portion contributes to heating. Each material has its own absorption spectrum, which is the range in which electromagnetic radiation is best absorbed. For this reason, Excelitas has selected the emission spectrum of the IR emitters for SLB so that they optimally heat the plastic of the cable sheathing. ■



SLB cables are used for onshore and offshore oil production.

Photo: Zach Theo/Unsplash

www.slb.com
www.noblelight.com

Less weight without compromise

How an extrusion blow-moulded body can be optimised and what role product and tool design play in this

“When the 3D design of a canister, taking all boundary parameters into account, first results in a 3D model and then in the first blow moulding tool that meets the customer’s sampling requirements, then we have done everything right,” says Jean Ingenbrand with satisfaction. This is exactly what happened with customer Exxon Mobil, who is gradually converting all of its production partners’ moulds at sites in Europe, Turkey and Egypt to the new design. The reason is obvious: 25 % less weight and therefore less material, lower transport costs and greater cost-effectiveness. K-PROFI finds out more about how this enormous weight saving was achieved without compromise in an exclusive interview.

Text: Dipl.-Ing. (FH) Karin Regel, Editor K-PROFI

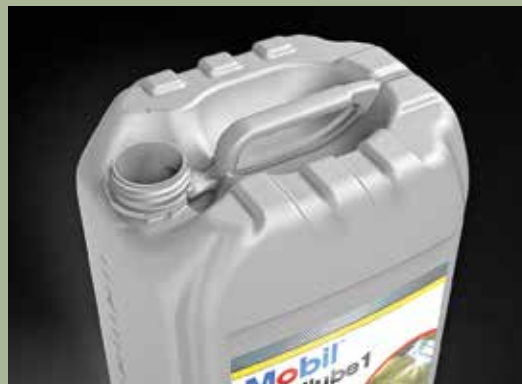
When it comes to sustainability and resource conservation, light weighting is often the first thing that comes to mind. “However, less material can also mean less performance,” says Jean Ingenbrand, managing director of fhw-moulds GmbH in Bottrop, who knows this very well. That is why his company attaches great importance to combining both aspects without neglecting functionality and aesthetics. “For us, design is the key to success.” With this premise, the supplier of complete systems specialising in extrusion blow moulding tools recently won over the US mineral oil company Exxon Mobil, headquartered in Irving, Texas.

Among other things, Exxon Mobil sells lubricants in self-designed 20-litre industrial canisters made of HDPE. These currently have a weight of 1,050 g. The aim of the joint project was to reduce the weight by 25 %. Ambitious! After all, all the general conditions still had to be met. The drop resistance of the canisters at ambient and

low temperatures, the stacking load capacity under long-term storage conditions, the dimensional stability during blow moulding and cooling, and the process consistency during production were not to be affected. At the same time, the conditions at the various blow moulding plants had to be “harmonised” so that identical canisters could be produced with the new tools at each location.

Involved from the outset

“Once we understood the requirements and objectives, we began creating 3D designs, taking into account all the peripheral parameters such as the cap, the dispensing opening, the pallet structure and any bulging when stacked.” At the same time, the compression pressure, internal pressure and stackability were checked using simulations. Physical tests were also carried out with the current canister. “It was clear to us that certain areas, in particular the bottom corners, the



During the development of the new tool and product design, all areas of the canister were put to the test, including the dispensing opening, the corners and the shoulder area.

Future 20-litre canisters from Exxon Mobil will be around 25 % lighter while still meeting all requirements.

Of course, the new canisters can be stacked easily without bulging.



handle connection and the shoulder transitions, had to bear the majority of the mechanical load. So these had to be designed in such a way that they could do this even with thin walls. Other areas, such as the wide side walls, consisted of excess material that did not contribute to performance and could simply be slimmed down," reports Jean Ingenbrand.

With the help of all the analyses and results, a completely new article with structurally optimised geometries was created. "We revised every radius, every corner, every transition to reduce local stress peaks and ensure a design suitable for production." After a 3D model was printed, the first tool was built and sent to the customer for sampling. Exxon Mobil was so satisfied that fhw-moulds was awarded the contract to convert all the tools at its partner companies. These are currently in production and are gradually replacing the old tools at the various locations. For Exxon Mobil, the new tools, which will be used to produce around 7 million canisters weighing only 800 g in future, mean a material saving of 1,750 tonnes of HDPE per year, reducing CO₂ emissions by around 4,000 tonnes per year.

Much more than tools

"In our projects, we do much more than just design the tool. After all, the design specifies where material is needed, but it is only through process control that it actually ends up in the right places," explains Jean Ingenbrand. The two magic words here are Partial Wall Distribution System (PWDS) and Push-Pull Ring (PPR). Radial control is essential, especially when forming the round blow tube into a rectangular or complex container. This is handled by the PWDS, which dynamically controls the tube wall during extrusion. Unlike other systems that compensate for sagging, the PWDS ensures precise wall thickness across the entire circumference. The statically deformable PPR works in conjunction with this system. This allows mechanical fine adjustment of the nozzle gap and thus targeted material displacement to specific areas of the tube. In combination, the two systems ensure correct material distribution



The extrusion blow moulding specialist created a new tool – and thus a new product design – for its customer Exxon Mobil.

and that more material is available where it is needed, e.g. in the corners, while the side walls are thinner.

A special feature of fhw-moulds is the cooling concepts for the tools, which differ significantly from those of other manufacturers and are applied consistently. While drill cooling is common, but only directly cools about 30 % of the article surface, the Bottrop-based company works with shell cooling. Both tool halves are enclosed by a cooled shell, so that between 70 and 80 % of the article surface is always cooled directly. "Shell cooling is much more complex to manufacture, which is why our tools are not among the cheapest," smiles Jean Ingenbrand. However, the more



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Jean Ingenbrand is proud of his company's ability to provide comprehensive support to customers – from design to commissioning.

expensive solution not only scores points for its higher performance, but also for its better CO₂ balance. In the case of Exxon Mobil's 20-litre industrial canister, shell cooling reduces the cycle time from 38 seconds to just 28 seconds. At the same time, the demoulding temperature is always below 60 °C, which ensures the dimensional stability of the canister. In summary, the new product and tool design delivers higher throughput with lower material consumption.



Thanks to its high level of vertical integration and the training of its own young talent, fhw-moulds keeps its expertise in-house.

Incidentally

During the conversation, Jean Ingenbrand repeatedly emphasises the holistic approach his company takes to every project. Although weight reduction was the main focus for the Exxon Mobil tool, a number of functional improvements allowed additional features to be incorporated. For example, the anti-glug device (AGD), an internal design modification in the canister, improves the air flow during pouring and speeds up emptying by up to 50 % – without gurgling or splashing. A visual tamper-evident feature indicates whether the container has been opened or refilled. Thanks to an ergonomic handle, the canister is easier to handle both with gloves

and with liquids with a high density of over 1 g/cm³. Finally, the improved design ensures better compatibility with regional pallet standards and higher cubic utilisation.

Jean Ingenbrand summarises the project as follows: "By combining simulation with a wealth of experience, we were able to create a new product and tool design that combines many advantages that go far beyond the pure material savings that the customer had requested. Holistic project management, including responsibility for quality and quality standards, is a matter of course for us." ■

www.exxonmobil.com

www.fhw-moulds.com

ABOUT FHW-MOULDS

fhw moulds GmbH in Bottrop currently manufactures around 60 to 80 extrusion blow moulding tools per year, but that is not their speciality. "Our speciality is comprehensive support," emphasises Jean Ingenbrand. His company employs 74 people, including 11 trainees, and can look back on 60 years of experience. During this time, 7,500 projects have been completed and over 11,000 tools have been built. "We get involved in the planning process with our customers at a very early stage and ask them exactly what product they want to manufacture and what goals they want to achieve." Then everything begins with the concept and design of the item, the tool construction, whereby fhw-moulds has a high vertical range of manufacture in order to control quality and delivery times

itself, the process adjustment and validation, and ends with the service. "We are one of the few toolmakers with process knowledge, so that all tools manufactured by us are run in and consistently maintained and optimised," explains Jean Ingenbrand. In 60 to 70 % of all cases, the core products for which the toolmaker is active are canisters and drums. In addition, the Bottrop-based company, with a business volume of around EUR 9 million, manufactures tools for consumer packaging applications, medical products and technical articles. Training young talent is very important to the extrusion tool manufacturer in order to retain and expand expertise within its own company and thus put its annual growth, which in the past was around 15 %, on a solid footing.

Swiss market more stable than others

Despite little change in the range of products on offer, the Swiss Plastics Expo attracted fewer visitors

After three days, the organiser, Messe Luzern, announced at the end of January that 3,800 visitors had attended the Swiss Plastics Expo. That was 300 fewer than at the two previous events in 2020 and 2023. The exhibition space occupied and the number of exhibiting companies and institutions remained virtually stable at 189.

The trade fair was once again dominated by machine manufacturers, equipment, tool and peripheral technology, tool suppliers, mould makers and plastics processors. While Engel, Arburg, Sumitomo-Demag, Wittmann and Dr. Boy were present with running exhibits, Swiss plastics machine manufacturers were once again absent this year. Toolmakers and their suppliers, as well as compounders and colourists, were once again somewhat less well represented. In contrast, the proportion of plastics processors, many of them injection moulding companies with additional offerings, thermoforming experts or specialists in 3D printing, as well as service providers for plastics processing, appeared to have grown further compared to 2023. The exhibitors, ranging from suppliers to plastics processors to plastics processors themselves, once again appealed to both processors and users of plastics. In terms of German trade fair concepts, Swiss Plastics Expo 2026 presented itself more than ever as a combination of “Kuteno” and “KPA”.

However, in discussions with exhibitors, a slight disappointment with the response was evident. Several exhibitors expressed their surprise to K-PROFI about the reluctance of visitors, given that business in Switzerland is far less volatile than in many other markets in Western and Central Europe. Ultimately, it seemed that Swiss plastics processors also had to cope with a 5 % drop in sales in 2024 and that the business of their national suppliers had fallen short of expectations in 2025 as well, following a double-digit decline in 2024. Many exhibitors were quite satisfied with the project activity in Switzerland, even if the volume was below the long-term average in some cases.

Plastics processor 1zu1 Prototypen from Dornbirn, Austria, used its presence at the trade fair to showcase its new brand identity as 1zu1scale and its transition to series production. With state-of-the-art 3D printing machines, injection moulding production



1zu1scale CEO Thomas Kohler presented the new brand image at the Swiss Plastics Expo in Lucerne.

and integrated toolmaking, small and precise plastic components in series quality can be produced in a short time, explained CEO Thomas Kohler in an interview with K-PROFI. “The early integration of 1und1scale in the development of components and assemblies enables faster scaling of production, especially for industries such as medical technology and electronics.” In addition to 3D printing, the company also focuses on small and particularly demanding components in injection moulding. Since 2022, 1zu1 has been part of the Swedish Prototol Group, a provider of industrial 3D printing manufacturing that is also active in injection moulding. Within the group, 1zu1scale will cover the DACH region and focus on delicate and precise small components.

In 3D printing for use in injection moulding tools, Ecoparts presented new manufacturing possibilities with an “Impact 4530” metal laser sintering system from Swiss

machine tool manufacturer IRPD. Thanks to four 1,000 W lasers, base bodies can now also be constructed more cost-effectively than conventionally. In segmented construction, the majority of the volume is created using thicker layers, while the smaller part relevant to the moulding process is created using a finer layer.

The quality of the exhibits at the trade fair had not diminished in any way among the machine manufacturers. Once again, this brought us full circle to the argument for establishing Swiss Plastics Expo in 2008 – that shortly after the K trade fairs, exciting exhibits from Düsseldorf should find their way to Lucerne to those Swiss interested parties for whom the journey to the world trade fair was too far. The principle is to continue after K 2028: Messe Luzern is planning the next Swiss Plastics Expo for 23 to 25 January 2029. Markus Lüling

www.swissplastics-expo.ch

Ecoparts founder Daniel Kündig shows 3D-printed inserts for injection moulding tools in segmented construction.



Hybrid injection moulding for air and thermal management

How Wirthwein manufactures mounting brackets for car front modules fully automatically



Wirthwein SE has ramped up series production at its headquarters in Creglingen of mounting brackets and various multifunctional brackets featuring controllable cooling air inlets. The structural parts, injection-moulded using hybrid technology, are installed by the module supplier into front modules for high-volume cars in the upper mid-range segment. Wirthwein has integrated the services of several supplier partners, ranging from the engineering of the moulded parts through tool design, component design with filling simulations and structural analyses, as well as automation, right through to quality assurance. To mark this milestone in the expansion of its strategic focus on airflow and thermal management, the family-owned company has built a new production hall and invested in fully automated production featuring new large-scale machinery.

Text: Dipl.-Ing. Markus Lüling, Editor-in-Chief K-PROFI

The project team with the plastic mounting bracket, to which the headlights, cooling units, antennas, locks, radiator pipework and cable ducts are attached during final assembly in the front end: (from left) Wolfgang Kemmer, Christian Müller, Stefan Lang, Harald Eisen, Mario Bresink and Thomas Kraus.

“The plastic mounting bracket is a key component in the front end,” explains Stefan Lang, “almost all components in the front-end area are mounted on it, such as headlights, cooling units, antennas, locks, radiator pipework and electrical wiring harnesses.” Of the 6 kg module weight, 4.5 kg is accounted for by polyamide, which corresponds to the shot weight in the single-cavity mould. In the multifunctional brackets, which are also included in the project scope, the closed fins facilitate engine warm-up after a cold start. During continuous operation at normal engine temperature, they open to improve airflow through the cooling system. This means that the smaller engines have controllable fins, whereas larger models do not. The various models together account for around 220,000 vehicles annually, spread across two volume models. There are two variants with adapted flap control and an additional flap-free sports version with approximately 12,000 vehicles per year.

“Thanks to the reinforcement provided by metal insert plates, the module can also support the airbag sensor. On the one hand, the bumper is hooked into and bolted to the module; furthermore, the gap between the bonnet and the bumper is adjusted by four additional adjustment elements,” explains Stefan Lang in detail, “because even in the

event of an oblique impact, the metal parts transfer the force to the airbag sensor.” Until now, Wirthwein has been primarily active in the development and manufacture of interior components, mainly window frame trims. Although hybrid technology using overmoulded sheet metal inserts has a longer history at the Cregling-based company, it has so far only been used for smaller components – the dimensions and production volumes of the plastic mounting bracket are new.

In line with the strategic direction

“From an application perspective, the mounting bracket is a strategic component because, in addition to the fan and the bezels – both of which we have been developing and manufacturing for some time – we can add further add-on parts and take many steps towards creating a complete front module,” says Thomas Kraus, Chief Sales Officer, explaining the project: “Plastic fans and ventilation modules – even in significantly larger sizes – are nothing out of the ordinary for us. At Wirthwein, we have established these within the strategic application of thermal management. Whether the fan is in motion or stationary is of secondary importance. As is well known, Wirthwein also serves many industrial customers with its expertise in

ventilation technology. In this respect, ventilation technology is generally of strategic importance to us. Airflow management – in other words, everything to do with airflows in vehicles, and the heating and air conditioning of data centres as well as industrial or residential buildings – is a key component of our strategy, which we refined in 2022 and relaunched in 2023.”

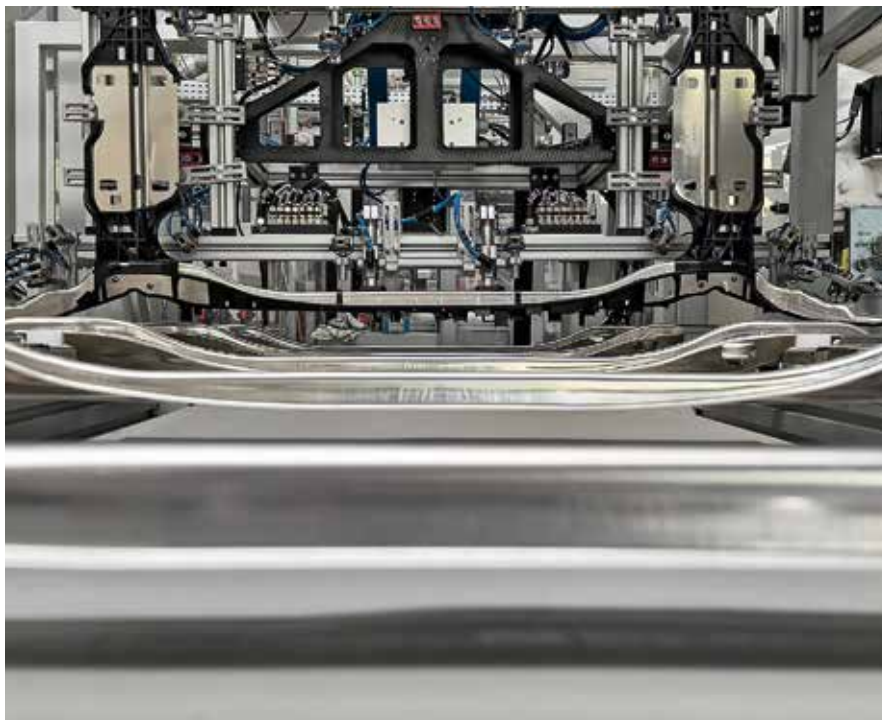
Thomas Kraus sees the second positive aspect in the design of the component and in the manufacturing technology: “On the one hand, hybrid technology is very important to us from a technical perspective as a complement to what we are currently capable of, enabling us to offer as broad a portfolio of manufacturing processes as possible,” he emphasises, “on the other hand, there aren’t many suppliers for components of this size who can actually manufacture them and manage the process steps. In this respect, the component fits perfectly into our strategy. As a group of companies focused on injection moulding, with injection moulding machines ranging from 3,500 to 24,000 kN, we can offer automotive suppliers and industrial customers small to medium-sized components.”

System integrator of the entire development

“There is certainly a good reason why the two brackets for the production models were placed with Wirthwein, even though we have only a short history in this technology,” Harald Eisen is convinced, “but the OEM chose us because, on the one hand, they trust us to handle the technological development of these complex components, and on the other hand, because our capabilities also allow us to handle series production.”

As is customary in vehicle manufacturing, the OEM had originally commissioned an initial development from a major development service provider. Following completion of the first concept development phase for the plastic mounting brackets and multifunctional brackets, Wirthwein took over the project in its entirety. “After the contract was awarded, we adapted the existing data, built all further steps upon it and further developed the module carriers,” reports Harald Eisen, “our development partner has played an important role at the OEM in engine technology and cooling technology for years – we have jointly further developed this major project and successfully industrialised it.”

The aluminium sheet metal parts are fed from a load carrier into the injection moulding cell. Robotic grippers pick them up for fully automated overmoulding and final assembly.



Focus on manufacturability, automation, packaging and assembly

A major challenge during development was designing the interfaces for securing components from other suppliers and incorporating these into the injection mould for the mounting bracket, without introducing unnecessary complexity – such as having to include too many sliders. During the ongoing process, changes to the fastenings of the attached components also had to be incorporated time and again.

“We held weekly design meetings – with the component manager responsible for the entire front-end of the OEM and all suppliers. During these meetings, necessary changes were discussed, clearances between static and dynamic components were checked,

responsibilities were clarified, the data status was reconciled and milestones were updated,” recalls Harald Eisen.

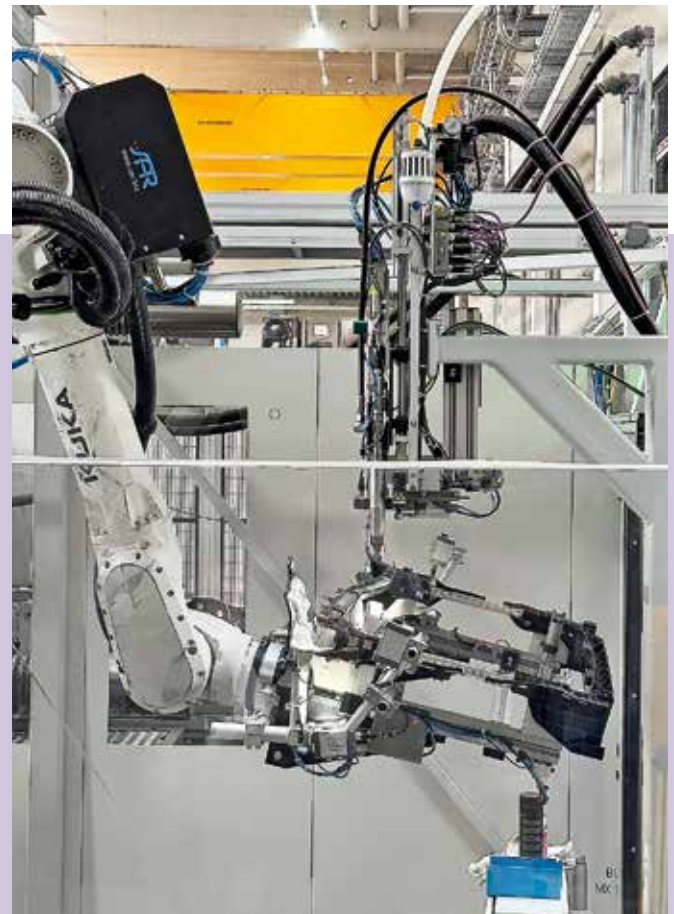
In addition to ensuring that any changes could be realised in terms of tooling, it was also essential to maintain the manufacturability of the brackets – that is to say, the automation processes involving removal, handling and packaging within the load carrier – as well as the ease of assembly at the module manufacturer’s site. From the initial concept through to the “design freeze”, Wirthwein had to respond to changes made by other suppliers through several rounds of modifications to the steel components. Moreover, each iteration usually involved several different changes occurring simultaneously. “But that’s perfectly normal when making changes to components close to the engine,” explains Stefan Lang.

Numerous simulation calculations accompanied the development, as the results of the structural analyses, for example, have far-reaching implications: “They affect everything from the extent of damage to the radiator or the frame in the event of an accident right through to the vehicle’s insurance rating,” explains Stefan Lang. The fully designed injection moulding tools were manufactured in Germany.

Fully automated overmoulding of a sheet metal insert to produce the finished bracket

In terms of process technology, the hybrid technology at Wirthwein is designed as the overmoulding of a sheet metal insert. The standard overmoulding material is PA6-GF30 or PP-GF30. For the heavier and more powerful engines, the project partners selected PA6-CF20 to achieve greater strength and stiffness, whilst still maintaining a certain degree of mechanical elasticity. The use of carbon fibres instead of glass fibres

The alignment, insertion and overmoulding of the sheets in the 16,000 kN injection moulding machine, as well as their removal, are fully automated using linear robots and six-axis robots.



After overmoulding, the screw rivets are riveted into the mounting bracket fully automatically.

simultaneously reduced the density of the polyamide compound by just under 10 %. During overmoulding, the polyamide mechanically interlocks with the metal. To reinforce the mechanical bond, openings are provided at several points in the sheet metal.

The automation was planned in Creglingen, presented in a rough concept and discussed in detail with several automation experts who already had experience with hybrid technology. The aluminium sheet metal parts – namely the so-called upper webs and two vertical plates – are sourced from a German supplier. For process monitoring during the injection moulding itself, Wirthwein relies on monitoring the internal mould pressure during overmoulding. In addition to this monitoring, cameras perform visual checks to ensure that the grippers are holding all the sheets and that all critical points of the bracket, such as hooks and latches, have been fully moulded, all necessary cut-outs are present, and no pins have broken off. With the aid of a six-axis robot, blind

rivets are set in the production cell after the injection moulding process for subsequent attachment to the car body.

No human intervention is required between the manual transfer of the sheet metal parts from a load carrier into the injection moulding cell and the loading of the filled load carriers with finished parts onto the lorry: Picking up, aligning, inserting, overmoulding, pressing in, inspecting and placing in the load carrier are fully automated. “An operator removes the sheet metal parts from a delivered transport container, places them on a conveyor line and then simply removes the fully loaded transport rack,” explains Frank Bensing, “otherwise we no longer carry out any manual work on the component.”

Minimised effort and space requirements for logistics

The multifunctional holders are packed into standard load carriers with inlays. The inlay compartments are specially designed for

plastic mounting brackets and can accommodate both product variants – with and without slats – for each of the two model series.

The transport systems for the plastic mounting brackets are standardised on the outside and designed on the inside to accommodate as many components as possible. After unloading at the module supplier’s site, they can be folded up and take up significantly less space in the lorry on the return journey, which contributes to the component’s CO₂ footprint.

To manufacture the components, Wirthwein has built its own hall at the Creglingen site and equipped it with a 16,000-kN and an 8,000-kN injection moulding machine – the larger one for the plastic mounting bracket, the smaller one for the cooling air inlet, including the corresponding fully automated assembly line. Series production has been underway since November 2024. 

www.wirthwein.de



Thanks to specially designed holders, the plastic mounting brackets can be transported in the special load carrier.



The injection moulding of the cooling air inlets and the assembly processes in an 8,000 kN injection moulding machine are also fully automated.



C10 cabin from Carvatech:
The windows are made of
PET-G, produced using a
thermoforming process.

Quality over quantity

How the Swissplast Group is continuing its strategic growth with transparent plastic components

A lot has happened since Barac Bieri took over Swissplast AG, Sargans, Switzerland, in 2011. The thermoforming specialist has gradually expanded his company through new ventures such as s-plast in Gotha, Germany and Swissplast Rail in Niederteufen, Switzerland, as well as acquisitions such as Al-Ko Plast in Ichenhausen, Germany and CAP Vakuform in Diedorf, Germany. Specialising in thermoformed components for sectors such as rail transport, commercial vehicles, caravans, building and energy technology, as well as mechanical engineering, the company supplies a wide range of industries. At the start of 2026, father Barac Bieri handed over the management of the Swissplast Group to his son Ninyan Bieri and immediately set him on his way with another new acquisition: k-tec in Radstadt, Austria. K-PROFI spoke to the manufacturer.

Text: Dipl.-Ing. Gabriele Rzepka, Editor K-PROFI



The windows of the C10 cabin are also made of PET-G ...



... as are the front panel hinged windows.

Ninyan Bieri explains the new acquisition: “We have a great deal of experience in the thermoforming business and are very well positioned in this sector. My father and I gave it careful thought as to where we wanted to go and decided that we want to continue growing – as long as the growth fits our portfolio. K-tec was a perfect fit for us. The company thermoforms transparent and semi-transparent plastics and is a true pro in this niche. Not everyone can do that, so k-tec is a superb addition to our capabilities.” Father Barac adds: “Up until now, we usually had to turn down enquiries for transparent components, as we only take on projects we’re truly capable of handling. With the acquisition of K-tec, we can now also offer our customers high-quality, transparent components.”

But the acquisition of the Austrian thermoforming company was a stroke of luck not just for the Bieri family. The previous owner, Thilo Üblagger, is also pleased to know that after 40 years his business is in good hands

and that he can retire with peace of mind. All employees will be retained, and k-tec GmbH will become swissplast transparent solutions GmbH in future.

A clear view on mountain peaks and the water

The specialist in transparent materials is not a traditional thermoforming company. In addition to flat-milled products, the focus is on the forming of transparent and semi-transparent plastics for visually high-quality components in one-, two- and three-dimensional designs. The company manufactures many components from PET-G, PMMA XT, PMMA GS and polycarbonate (PC). This includes the cabin windows for cable cars and protective covers for chairlifts, which safeguard passengers during the journey up the mountain.

To shape the covers, PET or PMMA GS sheets measuring 3,500 × 2,000 mm are heated in an oven. Once the required temperature is

reached, an operator removes the sheets and places them in the forming unit. The upper and lower moulds are pressed together, and the sheet moulds itself to the mould contour. Ninyan Bieri explains: “The tool coating is absolutely essential for producing a clean, transparent surface without unwanted particle inclusions. Furthermore, we use a special technique that ensures low-dust processing.”

Once the material has been formed and cooled, an operator removes the finished cover from the forming unit and sends it on to the CNC machining stage. Three 5-axis CNC machining centres are available, one of which can handle component sizes of 14,000 × 4,000 × 2,000 mm. Here, the covers are fitted with the holes required for assembly and the edges are trimmed before they proceed to the assembly line. There, staff insert bushings and threads so that the cover arrives at the customer’s premises ready for installation.



A cable car bottom window is being finalised in the 5-axis CNC machining centre.



And this is what the cable car bottom window looks like after the machining process.



The dimensions of the emergency lights can be up to 2,400 mm.

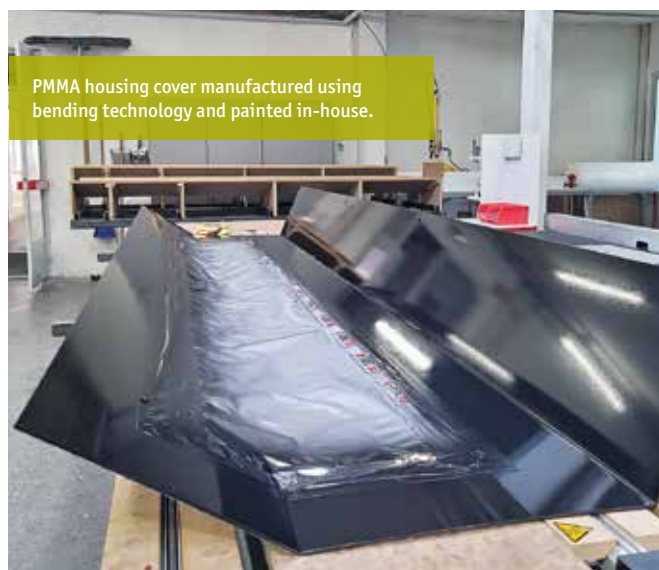


Workers prepare the lights for the assembly of the outer and inner shells.

The protective covers for chairlifts and cable cars are in demand worldwide. The Austrian company supplies them not only to the DACH region but also in larger quantities to Asia. Ninyan Bieri explains: “There aren’t that many suppliers in this segment, so we have a very stable market here.”

However, K-tec is not only present on mountain peaks but also on the water. Large panes for motorboats and yachts frequently leave the Austrian production halls. Here too, the three-dimensional shape is created in the forming machine. The material of choice is PMMA-GS – i.e. cast acrylic glass – due to its higher impact strength, excellent UV resistance and even better workability. The company manufactures the windows from sheets measuring up to 4,000 mm × 2,000 mm. After the forming process, the windows undergo CNC machining, followed by grinding, polishing and edge rounding.

Ninyan Bieri describes the advantages of the process: “With this forming technique, the material distribution is often more homogeneous than with thermoforming. The stretching of the material is significantly less and the component thicknesses are very uniform, meaning the component can withstand very high loads.”



PMMA housing cover manufactured using bending technology and painted in-house.

High-performance safety glass

With the acquisition of k-tec, swissplast has expanded its product portfolio to include ECE R43-approved polycarbonate safety glass for road-legal vehicles. The glass is therefore officially tested, certified and approved by the relevant authorities. The hard-coated, clear or tinted panes, with material thicknesses ranging from 4 to 15 mm, are manufactured in small and large batches ready for installation and combine high impact resistance, low weight and high optical quality. The company integrates logos, dot patterns, markings and customer-specific functional zones. “The manufacturing process developed by k-tec, which is unique in the market, gives us a clear unique selling point. The process allows for a high degree of design and functional freedom whilst ensuring full regulatory compliance. An extension of the homologation to DOT standards for the US market is also available as an option,” says Ninyan Bieri, describing further benefits that the acquisition of k-tec brings to swissplast.

Bending ensures high dimensional accuracy and surface quality

In addition to the forming machine, a bending and press machine is also available; a further press brake from Hesse + Co Maschinenfabrik was ordered shortly after the company takeover and is due to be delivered in February 2026. This new investment will enable shorter cycle times and the efficient production of more complex geometries.

A large proportion of the components manufactured using bending technology are machine casings, but also panels for equipment and vehicle construction, medical technology, the cable car industry and much more. Here too, the company processes transparent materials, for example for dividers in deep-freeze cabinets. These are produced from a 4 mm PC semi-finished product, which the company bends into compartments measuring from 870 × 300 mm up to 2,365 × 340 mm. Another product is a machine casing made from 8 mm thick grey PC measuring 1,200 × 1,800 mm. “Using bending technology, we can process components up to 3,000 mm in length and a maximum of 10 mm in thickness. Typical components are two-dimensional parts for cladding or housings,” explains Ninyan Bieri. The process is particularly suitable when two-dimensional geometries are required with high dimensional accuracy, reproducibility and surface quality. “It is also less cost- and energy-intensive than hot forming or

thermoforming. Bending excels with smaller radii but cannot be used with every material. However, the process works wonderfully with PC, PET-G and, with certain limitations, ABS," adds Barac Bieri.

Flawless transparent lights

For larger batch sizes, such as the production of emergency lights for fire engines or ambulances, traditional thermoforming is also available. In the emergency services sector, the company excels with a high level of vertical integration. The lights are made from transparent or semi-transparent, yellow, blue or red PC or PMMA GS – depending on the application.

The dimensions vary depending on the component. For emergency lights made from PC, the maximum length is around 2,300 mm, the maximum width around 900 mm and the maximum draw depth on the finished part around 250 mm. "If a customer requires even larger components, we could supply those too," emphasises Ninyan Bieri. For some customers, the company uses exclusively single-cavity moulds. Barac Bieri explains why: "The customer requests this for spare parts production. This allows them to reorder individual parts, and we can flexibly adapt our production batch sizes to their required quantities."

The Austrian firm also manufactures PMMA lights in various sizes. The longest light is 2,400 mm long, the widest around 700 mm with a draw depth of approximately 400 mm.

Larger products could also be produced using PMMA. However, for the acrylic emergency lights, only 2-cavity moulds are used, consisting of a left and a right light. "Here, we can only produce spare parts in pairs or individually at a higher price," explains Barac Bieri.

The thermoforming machine is loaded manually, the parts are subsequently removed manually, and the edge trimming takes place in CNC machining. When manufacturing transparent luminaires, distortion-free, mark-free forming without dust inclusions, as well as uniform wall thickness distribution, are absolutely essential. The components are mostly certified for lighting applications, which is why consistent quality is essential.

After CNC machining, the luminaires proceed to assembly. Here, staff install the electronics and cabling, and bond threaded bushings and brackets in place, so that the luminaires are sent to the end customer as a finished assembly.

This is where craftsmanship comes into play

"We generate high added value through our CNC machining. In addition to finishing the moulded components,



A worker is gluing a nozzle unit for clean air systems.

we also cut transparent and semi-transparent sheets of polycarbonate or PMMA here without damaging the surface," explains Barac Bieri. One example is panes for large aquariums. Cut to size, these are then bonded together to form the final aquarium. "With this operation, we are not involved in mass production, but in the specialised manufacture of complex components, many of which have very delicate surfaces. It's about quality, not quantity," Barac Bieri continues.

Without comprehensive assembly expertise and an in-house toolmaking facility, the operation would not function. Small to medium batch sizes and components are part of everyday life. The expert in transparent plastics can respond quickly to customer requests for changes. Craftsmanship is part of the daily routine, as both forming and bending require manual loading and unloading.

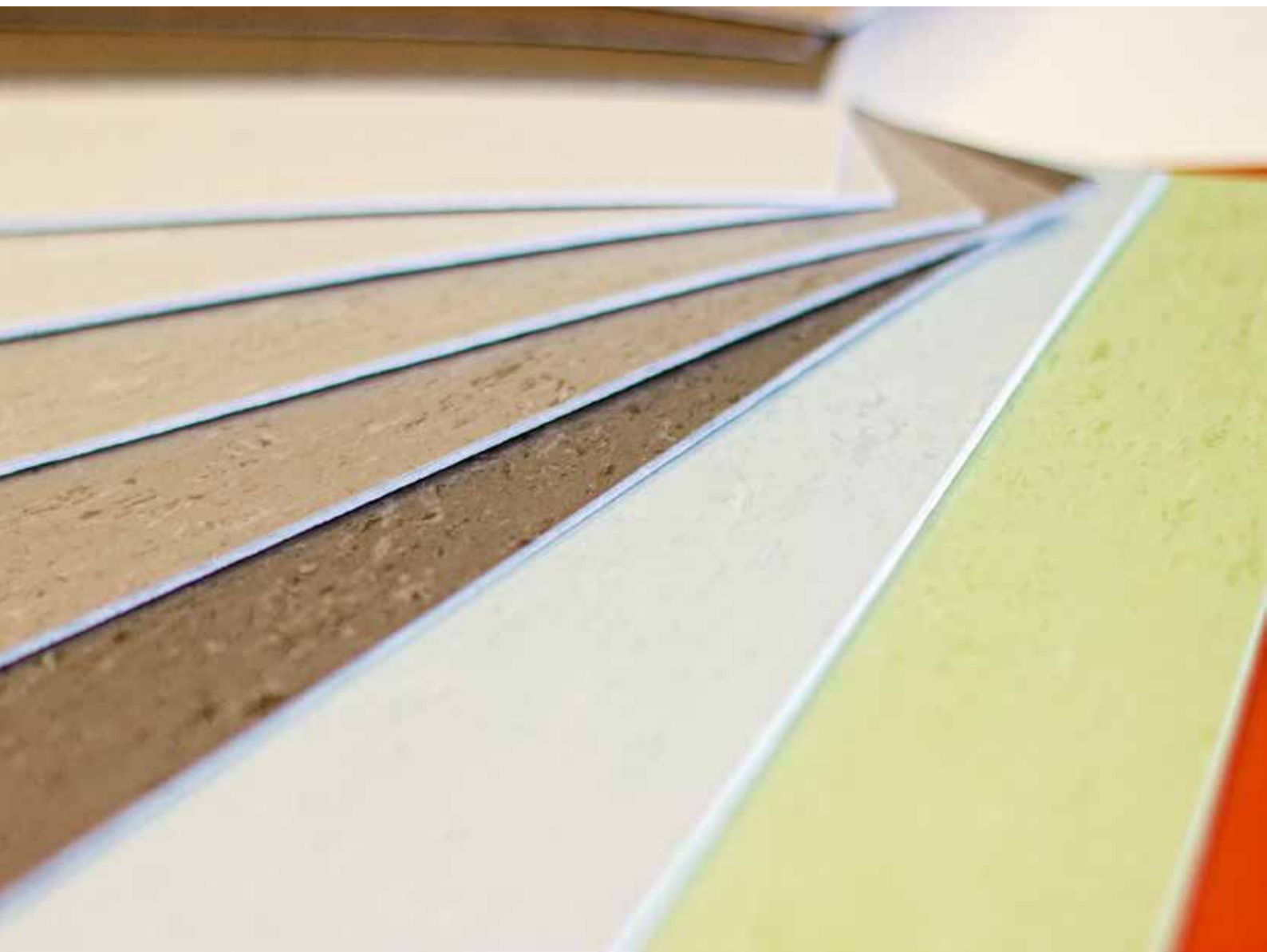
Father and son Bieri look to the future with confidence: "We will actively market our expertise in manufacturing transparent parts. This site is set to grow. Radstadt will become our centre for transparent components." ■

www.swissplast.com

Close-up of the round-polished edges of a PMMA GS windscreen for a motorboat



Fitted in the Frauscher Demon motorboat, the windscreen ensures a clear view.



Alexander Schulz (left) and Christoph Kemmerling see significant potential for savings in their company thanks to the virtual production assistant Vipra.



PVC floor coverings in various colours and designs are produced on the large-scale plant that fills the hall in Troisdorf.

Production assistant saves money

What potential for savings has flooring manufacturer Gerflor identified?

One large-scale plant – two processes, one product – two variants. What sounds so simple and straightforward is, in reality, highly complex. The large-scale plant at Gerflor Mipolam GmbH in Troisdorf fills the entire production hall and combines many individual steps. Only in this way is it possible to ultimately produce a high-quality, rolled PVC floor covering, 2 m wide and 20 m long, for large-scale projects in hospitals, hotels, shopping centres or industrial facilities. “We began working with a virtual production assistant back in 2019 to better coordinate individual steps, provide staff with more targeted information, improve overall plant efficiency, and identify and exploit potential savings,” emphasises CIP Manager Alexander Schulz. Together with process specialist Christoph Kemmerling, he presents some examples in more detail to K-PROFI.

Text: Dipl.-Ing. (FH) Karin Regel, Editor K-PROFI

Gerflor is regarded as Germany’s largest manufacturer of elastic flooring and operates production facilities in Delmenhorst, where linoleum flooring is produced, and in Troisdorf, where only homogeneous PVC floor coverings are manufactured. Both sites belong to the globally active Gerflor Group, headquartered in Lyon, France, which employs 4,500 people across 24 sites and, in addition to its main product range of floor coverings, also manufactures wall coverings, door thresholds and handrails. Around 300 employees work in Troisdorf. In addition to over a hundred different standard and custom colours, which are produced at Gerflor’s in-house colour mixing facility in Troisdorf, the PVC sheets differ primarily in one respect – their design orientation and, consequently, their installation technique.

Digital production

Due to ever-increasing competitive pressure, Gerflor decided as early as 2019 to fully digitise its entire production process, and above all the various extruders used in production.

“At the time, however, we were a little ahead of our time,” recalls Alexander Schulz, “the volumes of data we wanted to retrieve from the machines posed major challenges for both the data-generating and data-receiving systems. Fortunately, such problems have now been resolved.”

Today, six years on, the two project leads are happy with the progress made. “We collect nearly 2,000 process parameters from machines and systems and use this data for a variety of purposes, ranging from live production monitoring and key performance indicator generation to quality analysis and preventive maintenance,” explains Alexander Schulz. And Dr Kenny Saul, Managing Director and founding member of SHS plus GmbH in Dinslaken, which adapts the virtual production assistant Vipra to the specific requirements of a plastics processing plant, is enthusiastic: “Gerflor is embracing digitalisation, which is no mean feat given the complexity of an older plant.” He praises the commitment, expertise and deep understanding of processes demonstrated by the staff at the Troisdorf site.

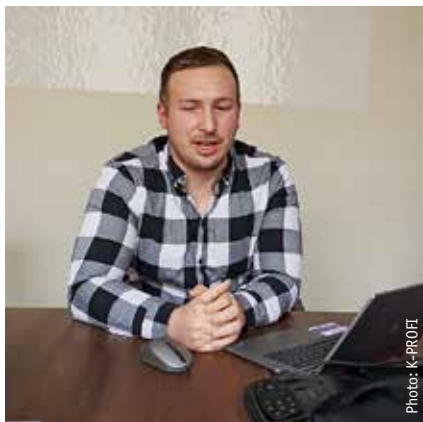


Photos: Gerflor

In addition to over a hundred different standard and custom colours, which Gerflor produces in-house at its own colour mixing facility in Troisdorf, the PVC sheets differ primarily in their design orientation and installation technique.



Dr Kenny Saul from SHS plus praises: "Gerflor is fully committed to digitalisation, which is no mean feat given the complexity of an older plant."



Production specialist Christoph Kemmerling is really thriving in his new role of using Vipra for the PVC plant.



CIP Manager Alexander Schulz: "We currently collect around 2,000 process parameters and use them for various purposes."

Transparency brings efficiency

"To get as far as we are today, SHS plus initially supported us in creating a digital twin of every machine component, so that we could collect as much data as possible and thus obtain the most accurate insights," explains Christoph Kemmerling, who is really thriving in his new task of using Vipra for the PVC plant. "I've always had a keen interest in data acquisition and programming, and I'm delighted to be able to take on this role alongside Mr Schulz," explains the 29-year-old master industrial mechanic. He praises Vipra as a "well-stocked toolbox" that enables many data points and faults to be identified and subsequently rectified.

Gerflor also uses Vipra specifically in a wide range of projects to optimise costs, improve quality and increase process stability. Two of these projects are the precise longitudinal cutting of the rolls and surface monitoring. "To ensure a smooth and flawless surface on the floor coverings, the varnish must

be applied evenly to the PVC roll at a defined thickness," explains Christoph Kemmerling. Thanks to Vipra, this can be achieved through online weighing, ensuring there is no waste and quality is 100 % guaranteed. For Alexander Schulz, this is a fantastic result that pays off for his company: "Over the past year and a half, we have identified potential savings amounting to roughly 20 times the cost of digitalisation."

Reducing work steps

Of course, the production assistant also helps to reduce work steps that go far beyond simply eliminating documentation with a pen and clipboard. All data is now recorded digitally and made available in a structured format, which reduces the workload for staff and ensures transparency. It is also possible to react directly in real time should any specification limits be breached. "The switch to digital forms in Vipra has not yet been fully implemented across the board, but is already well advanced," assures Alexander

Schulz. Other important tools being used include trend and drift analyses, which highlight emerging faults at an early stage and enable intervention.

It goes without saying that Gerflor cannot afford any downtime in the large-scale plant. The process must keep running. That is why automated wear monitoring and the predictive maintenance built upon it are a further benefit of Vipra. Among other things, the specific throughput of the extruders is automatically calculated in real time within the assistance system and monitored for any emerging trends. If the specific throughput drops, this is an indication of increased wear. If further parameters confirm this assumption, components can be replaced in a planned manner before an unplanned shutdown occurs. "For us, this represents significant potential for savings," says Christoph Kemmerling. 

www.gerflor.de
www.shs-plus.de



Gerflor manufactures PVC floor coverings for hospitals, hotels, shopping centres and industrial facilities.

Photos: Gerflor

“A rising recycling rate alone is no cause for celebration”

How the chairman of the bvse (German Association for Secondary Raw Materials and Waste Management) assesses the state of plastics recycling

The German Central Agency Packaging Register (ZSVR) and the Federal Environment Agency recently reported a plastics recycling rate of around 71 % for Germany in 2024. At first glance, these figures appear clearly positive. But anyone familiar with the recycling industry knows that they do not reflect the actual situation in which the majority of companies currently find themselves.

The proudly announced 71 % are so-called feed rates. However, the fact that material enters a plant is far from guaranteeing that it will be turned into a marketable secondary raw material or that it will actually be used.

Whilst the rates are rising, the economic situation for many plastics recyclers is worsening. In Germany and Europe, numerous companies have gone out of business or significantly reduced their capacity over the past two years. At the same time, the warehouses of the remaining recyclers are overflowing. Tens of thousands of tonnes of high-quality recyclates are waiting for buyers, even though high recycling rates are formally reported.

Let's not kid ourselves: recycling without demand is not a circular economy. When recyclates sit in stockpiles, we generate statistics, but we do not conserve resources. This imbalance is also evident in the recycling of flexible plastic packaging. There are still far too few markets for this material. To meet their statutory quotas, sorting plants pay recyclers more money than they would have to pay waste incineration plants – simply so that the regranulators will take the material at all. There can be no talk of genuine sustainability here. This is economic perversion.

Furthermore, high-quality plastic recycling to the ZSVR's minimum standards – i.e. the actual substitution of new fossil-based materials – currently stands at less than 8 per cent – and this includes PET bottles. At the same time, more than half of all plastic waste in Germany is incinerated.

The recycling industry is on the brink of collapse. Insolvency filings are mounting. We are currently losing facilities and expertise that will be urgently needed in the future. These capacities cannot simply be rebuilt before the PPWR (EU Packaging and Packaging Waste Regulation) comes into force with its recycled material usage quotas. If Germany is to become a pioneer in Europe when it comes to plastics recycling, it needs reliable off-take of recycled material and consistent use of recycled materials by brand owners and retailers. Otherwise, the plastic circular economy risks being further undermined.

We should not paint the situation worse than it is – but please do not sugar-coat it either. A rising rate alone is no cause for celebration. The structural crisis in plastics recycling is real, and it cannot be resolved simply by pointing to high figures. 



Photo: bvse

Dr Dirk Textor, born in 1962, studied chemical engineering at TU Dortmund University and obtained his Dr.-Ing. degree in landfill technology at the University of Applied Sciences Essen/Duisburg. Since 2014, he has worked as a project engineer at Graf Polymers in Teningen. He also works as a self-employed consultant at Dr Textor Beratungsgesellschaft. Since 2011, Textor has been Chairman of the Plastics Recycling Association within the Federal Association for Secondary Raw Materials and Waste Management (bvse) and also sits on the advisory board of the Central Agency Packaging Register (ZSVR).

"We already have a long-standing partnership with Erema. We are very impressed by the recycling systems, which are ideally suited to processing film scraps," says Heinz-Henning Seute, praising the machine supplier.





“We only do one thing. But we do it exceptionally well!”

Why recycle manufacturer LH-Plastics advises establishing material streams right now

Until recently, it was unthinkable to produce a 15- μm film from recycled material. Now it's official: yes, it is possible. Not only possible, but it's already being done. And that's using regranalates from LH-Plastics in Werdau, Saxony. The processor has specialised in processing PIR and PCR film waste made exclusively from PE, has purchased a new recycling line, is planning another, is RecyClass-certified and has been growing for years. Managing Director Robby Beckert and Managing Partner Heinz-Henning Seute explain what contributes to the company's success, why employees remain loyal to the firm, why ten applications arrive every week, and what all this has to do with diamonds, in an on-site interview with K-PROFI.

Text: Dipl.-Ing. (FH) Karin Regel, Editor K-PROFI

Part of the reason for the high quality of the recycled material from Werdau – which enables film manufacturers to produce films as thin as 15 μm – is the Ready Mac recycling line with a laser filter, installed in September, from the recycling machinery manufacturer Erema in Ansfelden, Austria, which replaced an older system. “The laser filter ensures that our recyclates are clean and free of specks,” Heinz-Henning Seute is certain. The highlight of the system is that it is a standardised unit, available from stock, with a guaranteed output of 500 kg/h. Heinz-Henning Seute comments: “We ordered the system, it was delivered on Tuesday, installed on Thursday and went live on Friday.” He is very satisfied with the system's performance, but above all with the quick and straightforward commissioning. Both managing directors are in fact so satisfied that they have already firmly planned the purchase of a second Ready Mac. This will be Erema's seventh system, which this time will be installed not as a replacement for an old system, but as an additional unit.

This means that four systems will be operational at LH-Plastics next year, further increasing the production capacity from the current 10,000 t/a. “We want to be well prepared,” says Robby Beckert, who is certain that with the legislative changes in the packaging market, which will come into force by 2030 at the latest, recycled material could become scarce. At present, virgin material is too cheap, he notes, with the result that some processors have been driven into insolvency. “Material flows must be secured now, both within and for Germany and Europe,” emphasises Heinz-Henning Seute as well. Although film scraps are no longer shipped to China, a great deal of high-quality waste is still sent abroad, a situation the pair view very critically: “We need reliable supply chains for recyclates in Europe, and we are doing our bit to achieve that!”

Increasing the PCR share

LH-Plastics specialises exclusively in PE film scraps, which the company sources from a fixed base of suppliers. “With our team of 30 employees, we are still too small to have our own sorting and washing plant, so we purchase mixed films that are either generated during the production of various film manufacturers or as post-consumer

Heinz-Henning Seute makes a strong appeal: “Material flows must be secured now; we must keep and utilise our resources in Europe.”



“Our customers are quite amazed when they see that we even have our own small blown film line for testing purposes,” says Robby Beckert happily.

waste from wholesalers and DIY stores,” says Robby Beckert, describing the input stream, and adds: “We can easily process film scraps that have labels, provided they have been stored in a dry place.” Currently, around 20 % PCR film and 80 % PIR film scraps are fed into one of the three extruders, although “over the next few years, the input stream is to be shifted to a ratio of approximately 1/3 PCR to 2/3 PIR,” says Robby Beckert, outlining the plans.

Laser filter as a key component

The increase in the amount of PCR that can be processed is made possible by the use of both the already installed Ready Mac with laser filter and the planned one. After all, unlike piston screen changers in the other two systems, the laser filter ensures a high-purity melt with up to 50 % lower melt losses. And this is achieved without manual intervention by the operator thanks to the high degree of automation.

The laser filter operates with very fine filter screens of up to 70 µm and captures the contaminated melt coming from the extruder between two laser-drilled (hence the name) screen discs arranged parallel to one another. After the melt has been pressed through the screen discs, it leaves the filter clean via the collection channel. Contaminant particles remain stuck to the screen and are scraped off by three scrapers mounted on each side of the screen discs and transferred directly to the discharge system, so that the filter can operate undisturbed again and the melt can flow through unhindered.

As the melt does not pass through any rotating or moving parts in the clean zone, a short residence time is guaranteed, as is the elimination of packaging and the resulting black specks. Robby Beckert comments: “For us, the filter means a high degree of cost-effectiveness; for our customers, it means a particularly high-quality material based on PCR material, which can also be processed into thin and ultra-thin films.”

Exclusively PE

On the three recycling lines, all of which are equipped with a shear compactor, an extruder and a hot-cut granulator, LH-Plastics produces PE regranulates with various MFI values, mechanical properties and colours from HDPE, LDPE and LLDPE input material in a three-shift operation. “To be able to offer ideal colours, the respective shift

supervisor sorts the delivered film scraps and gives the plant operators precise instructions on how to mix them,” explains Robby Beckert, who praises the wealth of experience of his staff, on whom he can rely 100 per cent.

The result is granulates in transparent, light multicoloured, dark multicoloured and green, as well as in custom colours at the customer’s request. LH-Plastics operates a well-equipped laboratory not only to meet customer requirements but also for its own quality control and assurance, taking a sample from every BigBag and analysing it. The highlight of the laboratory is a mini blown film line, which Heinz-Henning Seute

ordered online from a Chinese supplier and was a little surprised when it actually arrived five months later. It works excellently and is equipped with standard components available locally.

A shared endeavour

Just as modern and cool as the two young managing directors are in handling orders, for example, they are in their dealings with their staff and on social media. Robby Beckert comments: “I’ve been with the company for 18 years now and have known many of the current staff since day one.” “We involve our staff in many things, regularly organise

joint events – such as a full-day Christmas party, for which the business is closed for the day without further ado – and pay more than minimum wage,” says Heinz-Henning Seute, outlining a few points that go down very well with his staff.

One shared activity that everyone enjoys is the films shot at the company, which can be found on the website as well as on YouTube. There are now three films: “Saxon Diamonds”, “House of Diamonds” and “Time of Diamonds”. The latest film explores the question of what remains after the apocalypse and concludes that plastics, much like diamonds, are durable and must be preserved. “We must keep plastics in the cycle and secure their material flows,” Heinz-Henning Seute emphasises, stating that this is very important to them both personally and as a company, and reiterates that “it’s high time” to act.

Impressive flexibility

“It’s incredible how much attention we’re generating with our videos and posts on LinkedIn and Instagram,” says the managing director with delight. He sees this, among other things, in the roughly ten job applications that land on his desk every week – he’s never heard of a skills shortage. But he also notices it in the customer enquiries, to which he and his team can respond quickly and with great flexibility. “Not only do we handle the collection of film scraps – which we can easily collect either in a container, with a articulated lorry or a walking floor – but we also manage the order processing,” promises Robby Beckert. “We produce for our customers on a just-in-time basis or for stock, and guarantee that even when collecting twelve lorries with a total of 240 BigBags, the quality of the first and the last is absolutely identical.” Here, the managing directors certainly see their company’s particular strength: ensuring output quality even when input quality fluctuates.

“Customers can use our regrgranulates to produce any type of film except those for the food or medical sectors, as this is not yet permitted,” says Heinz-Henning Seute, describing the potential applications. Common areas of use include bin liners, bubble wrap, mailing bag film and tarpaulins for the textile industry. 

www.lh-plastics.de
www.erema-group.com



Photo: LH-Plastics

When it comes to filming, the staff at LH-Plastics are absolutely on fire and are happy to step in as actors.



Photo: K-PROFI

The LH-Plastics team has even set up its own podcast studio. It will soon go live with its own podcast.

Sources of supply/suppliers directory

The A to Z of the plastics and rubber industry

Air filter technology



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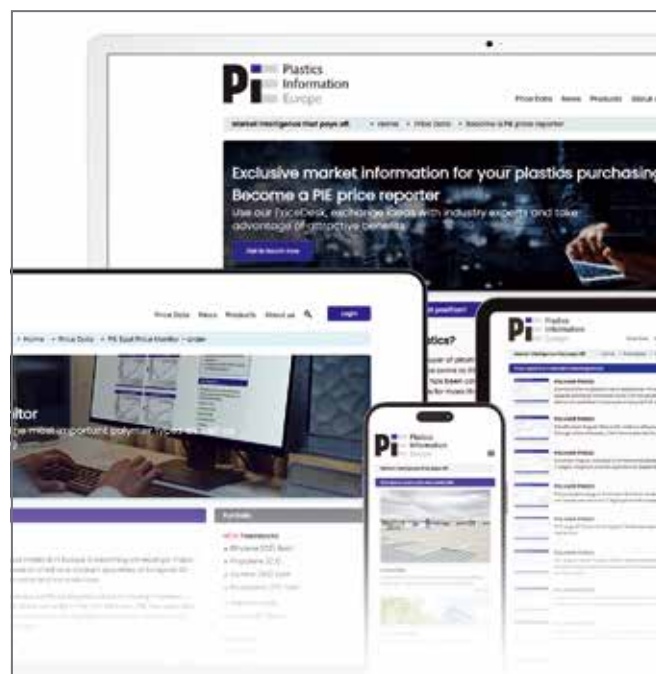


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AI as a catalyst for plastics processing

Artificial intelligence has arrived in the plastics industry – not as science fiction, but as a tool. And as with any tool, it is not its existence but how it is used that determines success or failure. The question is therefore not whether AI will transform the industry, but how quickly companies adapt to it.

A look at other professions seems more dramatic at first glance. Lawyers and tax advisers are already experiencing how AI is encroaching on their core business. Contract analyses, research, standard reports or tax returns – much of this can be automated. In these fields, it is not just ef-



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ficiency that is at stake, but the business model itself. In plastics processing, the situation is more down-to-earth. AI cannot replace an injection moulding machine, a mould or experience with materials. Physical value creation remains. The risk is more subtle: those who do not use AI will fall behind. And in a market with high pressure on costs and innovation, being slower means losing out in the medium term.

Software-based companies, too, must reposition themselves. Major ERP providers are already sensing that AI is democratising standard processes. What used to require complex customisation projects can now be modelled much more quickly. The same applies to specialist providers in the plastics industry – such as MES providers. Pure data collection or reporting is becoming interchangeable. The added value is shifting towards intelligent evaluation, predictive analytics and automatic process optimisation. Those who integrate AI are expanding their business model. Those who ignore it are reducing themselves to a mere data repository.

Process simulation is particularly exciting. Companies such as Cadmould or Moldflow have always worked with complex models and iterative optimisations. This is precisely where AI comes into its own: varying parameters more quickly, automatically recognising boundary conditions and shortening optimisation loops. The physics doesn't disappear – but the path to a reliable result becomes shorter. This is not a risk, but a massive boost to productivity. The bottleneck shifts from computation to evaluation. Expertise is not devalued, but leveraged.

And what about programmers, computer scientists and automation specialists? Yes, AI writes code these days. Yes, it generates function blocks and suggests architectures. But it does not take responsibility. The job profile is changing – moving away from pure coding towards system architecture, validation and integration. The pace is accelerating, prototypes are produced faster, and iteration cycles are drastically shortened. Short-term successes become more visible. At the same time, the need for control is growing. Anyone who adopts AI code without checking it is simply producing errors more quickly.

AI could become a real game-changer, particularly in the specialised machinery and plant engineering sectors. Custom PLC programmes, process logic and visualisations can be created and documented more quickly. The chronic shortage of "qualified personnel" is not disappearing, but their productivity is increasing significantly. With AI support, an experienced engineer can manage more projects, test variants faster and develop processes in a more structured manner. This is not a replacement for humans – it is a reinforcement.

My conclusion: For plastics processing, AI is neither a threat nor a panacea. It is an accelerator and, at the same time, a solution to bottlenecks in programming. It is not AI that replaces humans. Rather, it is the person who consistently uses AI who replaces those who hesitate. 

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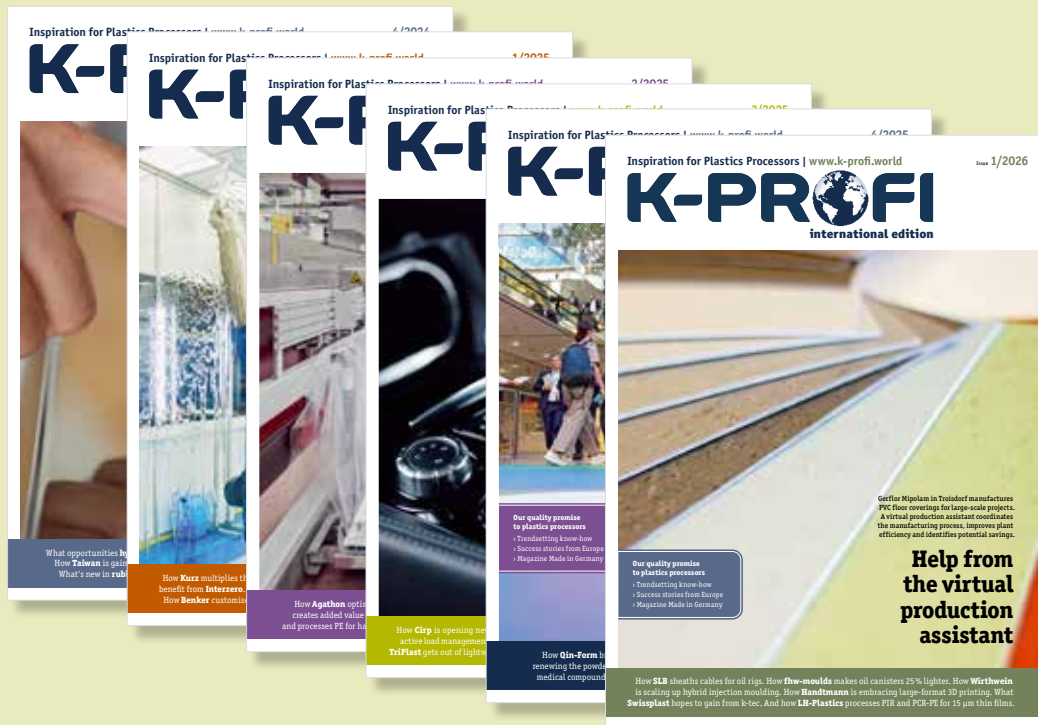
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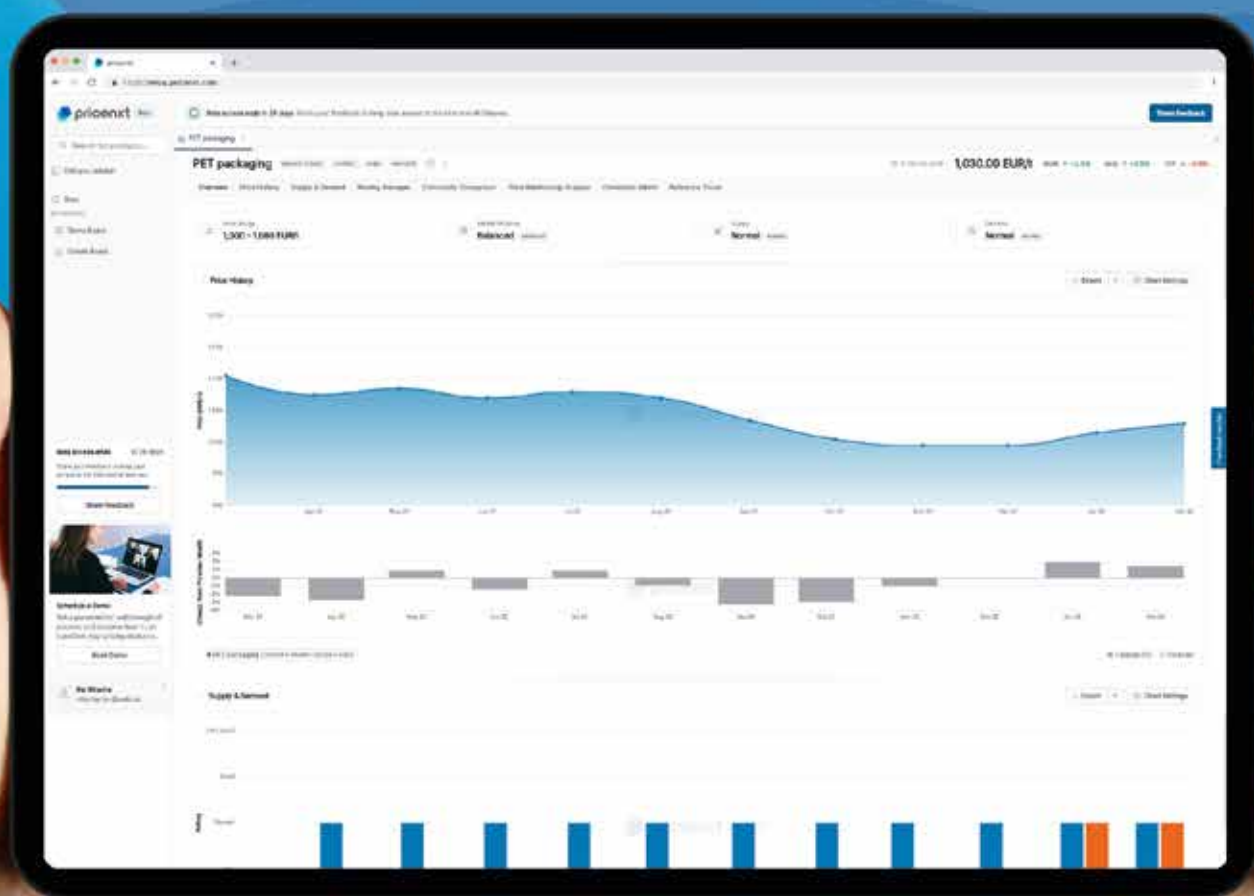


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