

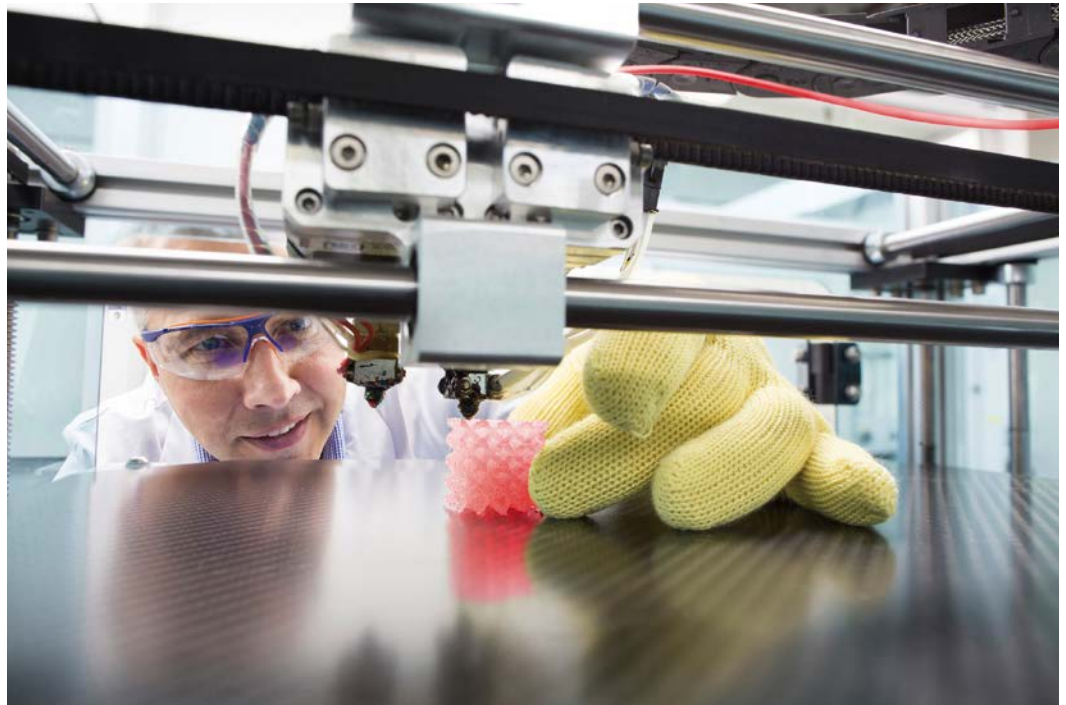
Familiar Face with a New Look

Covestro Makes its Premiere and Commits itself to Sustainability

One year after its spin-off from Bayer, Covestro will showcase new developments, strategies, and projects. With the completion of the new industrial production plant for CO₂-based polyurethane foam, an advanced and sustainable research project has been commercialized. The company plans to move further in this direction. At the K fair, it will present a new concept vehicle with wraparound polycarbonate glazing.

There is currently a lack of suitable materials for additive production processes. For this reason, Covestro is also developing an appropriate range of materials. A research and development laboratory has been set up specifically for this purpose in Leverkusen

(© Covestro)



The first time is always somewhat special. Employees of the new Covestro AG, Leverkusen, Germany, will always remember this year's K. Almost exactly one year after its spin-off from Bayer, the former Material Science Division is making its entrance self-confidently onto the stage – not only commercially but also technologically. "Our industry takes full responsibility for its actions," emphasized Patrick Thomas, Chairman of the Covestro Management Board, "but it also develops a broad spectrum of solutions to address global challenges." The new company has committed itself to this philosophy and is continuing established projects as well as starting new developments.

An Eventful Year

The eventful year began in September 2015 when Covestro became legally and commercially independent from Bayer. The latter remains the sole owner with a current shareholding of around 64%. Following legal independence, the company was floated on the German stock exchange on October 4, 2015 and listed in MDAX on December 21 last year. The economic environment was anything but ideal with the weakening Chinese economy and the height of the VW emissions scandal. After all the turbulence, however, Thomas was very satisfied with the annual turnover of EUR 12.08 billion in 2015,

which represented an increase of 2.7%. "We have demonstrated earning power and financial strength," said Thomas. Despite falling selling prices, this success was achieved thanks to higher sales volumes and a more favorable supply and demand situation.

The first quarter of 2016 started successfully. As compared with the same period the previous year, EBITDA improved by 29.3% to EUR 508 million. The Polyurethane and Polycarbonate divisions also showed strong sales volume growth in their core business, with an overall Group-level increase of 8.5% compared with the first quarter of 2015. The world economy is expected to grow by 2.6% in



Fig. 1. Start of industrial production of CO₂-based PU foam: up to 5000 t/a of the material with the new brand name cardyon can now be produced in Dormagen © Covestro

2016. In Covestro's core business, volume growth in the mid-single-digit percentage range is forecast.

Beyond Carbon Dioxide

The initial financial position led to some investments in Dormagen and Brunsbüttel, both Germany. A new coextrusion plant for multilayer film is being built in Dormagen at a cost of some EUR 20 million, including infrastructure and logistics. It is due to be commissioned in 2017 and will create 15 new jobs. The products manufactured in this plant will be suitable for security cards, automotive interior components, medical devices, displays etc. In Brunsbüttel, Covestro is investing "a low-three-digit million euro sum" to upgrade its production facility. A plant for the manufacture of the foam precursor toluene diisocyanate (TDI), which has already been closed down, will be converted to produce methylene diphenyl diisocyanate (MDI). MDI is required to produce polyurethane (PU) rigid foam, while TDI is used for flexible polyurethane foam. Production of the latter will be shifted to the central site in Dormagen. Through this investment, MDI production capacity will be doubled to around 400,000 t per annum. Commissioning is scheduled for the end of 2018.

A strategically important production plant was similarly opened in Dormagen in mid-June (Fig. 1). Here, polyols are now being produced on an industri-

al scale with carbon from carbon dioxide. These polyols are a key building block for PU foams with 20% CO₂ content. The inert CO₂ molecule is chemically incorporated into the material and can be effectively used in the form of PU foam, e.g. for mattresses or furniture upholstery. A brand name for the CO₂-based PU foams has already been decided, namely "cardyon". The name derives from the terms "beyond" and "carbon". The new plant cost around EUR 15 million and has a production capacity of 5000 t/a. The CO₂ used is a waste product from a neighboring chemical company. If the market launch goes successfully, Covestro visualizes significantly expanding production.

From Flying Laboratory to Refugee Housing

Covestro's activities around the use of carbon dioxide for the synthesis of plas-

tics make the basic direction of the company very clear: Covestro sees itself as a sustainable and resource-saving company that wants to help processors and end users reduce their dependence on oil and shrink their ecological footprint. In this respect, the company is setting a good example as it has undertaken to halve its emission of greenhouse gases such as CO₂ per tonne of product by 2025 (based on the 2005 emissions). In addition, Covestro wants to drive "sustainable innovation" and devote some four fifths of its expenditure to research and development, also by 2025. By then, 100% of the suppliers should actually be sustainable. But in response to a critical question, Thomas had to somewhat correct this assertion because who is after all 100% sustainable? For this reason, he had to leave it that companies would continually strive to achieve sustainable products and processes.

The flagship, so to speak, of this strategic direction is the round-the-world flight of the solar-powered airplane Solar Impulse. Thomas described the benefits that his company had derived from this project he called a "flying laboratory for material innovations". The airplane recently landed again in Abu Dhabi, from where it took off over a year ago. The material producer already has a new sponsorship project in mind. It relates to affordable materials to improve the quality of life of disadvantaged sections of the population, such as those suffering from the effects of climate change or living in poverty or underserved markets. To this end, the aim would be to develop practical materials and components to create more housing, improve hygiene or safeguard food storage. For example, PU insulating panels can be used to build affordable housing units for refugees quickly. Depending on requirements, Coves- ➤



Fig. 2. No more than this detail of the new concept car can be revealed at present. However, it is said to be fitted with lighting functions based on holographic films instead of headlights and lamps © Covestro

tro will link up for the projects with local partner networks, including construction companies, contractors, public authorities, financial service providers, and civil society.

Service

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Lifestyle Electric Car with Trendy Exterior Design

At the Kfair, Covestro will be seen in a new and extremely colorful guise. But its long tradition and history cannot and will not be hidden. Some 50 years ago at K67, Bayer exhibited a concept car with an all-plastic body; this year Covestro will be showcasing a concept for a lifestyle electric car (**Fig. 2**). Technical highlights include polycarbonate wraparound glazing, holographic lighting, and a seamless front end. Another promising development is that of new materials for 3D printing (**Title figure**). With these in mind, the company has commissioned a new laboratory for 3D printing in Leverkusen and is now looking for partners.

Covestro currently already supplies materials for fused deposition modeling, thermoplastic polyurethanes for selective laser sintering, and liquid resins for stereolithography, digital light processing, and inkjet printing. Now the range is to be extended to include filaments, powders, and resins for all current 3D printing processes.

For the first time, a Science Celebration will take place on the Covestro booth during the Kfair, at which a professor will be presented with an award for scientific achievements. In this way, Covestro is emphasizing the importance of cooperation with universities and institutes, through which it sees itself generally well prepared for the future. ■

Franziska Gründel, editor

ecovio EA

Compostable Particle Foam with High Bio-Based Content

BASF SE, Ludwigshafen, Germany, is expanding its range of high performance foam products with the innovative, certified compostable particle foam ecovio EA. The product is predominantly bio-based and, like all of the grades under the ecovio brand, it supports the biological cycle through its certified compostability.

ecovio EA is particularly suitable for transport packaging for high-value or delicate goods where a high level of impact resistance and robustness is vital. The product properties are similar to those of EPS and boast outstanding energy absorption and very good resilience even when subjected to multiple impact loads. The high bio-based content and the certified compostability make ecovio EA particularly attractive wherever a fossil packaging solution no longer meets customers' requirements for a bio-based and biodegradable transport solution.

ecovio EA consists of the biodegradable BASF polymer ecoflex and polylactic acid (PLA), which is derived from corn or other sugar-generating plants like manioc. To produce ecovio EA, expandable granules are charged with the blowing agent pentane in an innovative process. This step enables trouble-free pre-expansion of the material on conventional EPS pre-expanders and subsequent molding. The raw granules themselves have a density of ap-



ecovio EA is the first expandable, closed-cell foam material which is bio-based and certified compostable © BASF

prox. 700g/l. ecovio EA is available in the market with a particle size of 1.05 mm. In addition, a further grade with a diameter of 0.8 mm is under development. The particle foam is available in brown and is delivered to customers in an octabin. The product can be stored there in appropriate storage facilities for at least six months without any quality impairment.

Processors can form ecovio EA into an almost limitless range of shapes in two steps. In a first step, the granules are pre-expanded with the addition of steam to produce closed-cell beads with an adjustable minimum bulk density of 25 g/l. A short prefoaming time contributes to a low energy consumption in this production step. Following this, the expanded granules can finally be processed into all kinds of different molded parts. Custom-

ers benefit from the fact that the processing can also easily take place on existing EPS or EPP production machines. The very similar processing characteristics mean that there is no need for any conversion of the machines and existing production processes do not need to be substantially modified.

In a direct comparison with EPS, ecovio EA has lower rigidity and when it comes to its energy absorbing capacity it comes between EPS and EPP. These properties make this material perfect for use in the E&E sector as well, in particular for heavy and delicate packaged goods such as washing machines or televisions, which need to remain unscathed right along the transport chain even if they are subjected to multiple, heavy impacts. Furthermore, ecovio EA has a minimum thermal conductivity of 34 mW/(mK) and is therefore also outstandingly suited to all thermal insulation applications in the transport sector. For example, ecovio EA helps to maintain the cold chain at all times for temperature-sensitive goods such as packaged vegetables, fruit, meat, frozen goods or even medicines. This effectively prevents the goods from being ruined.

To the manufacturer's product presentation:
www.kunststoffe-international.com/1487661