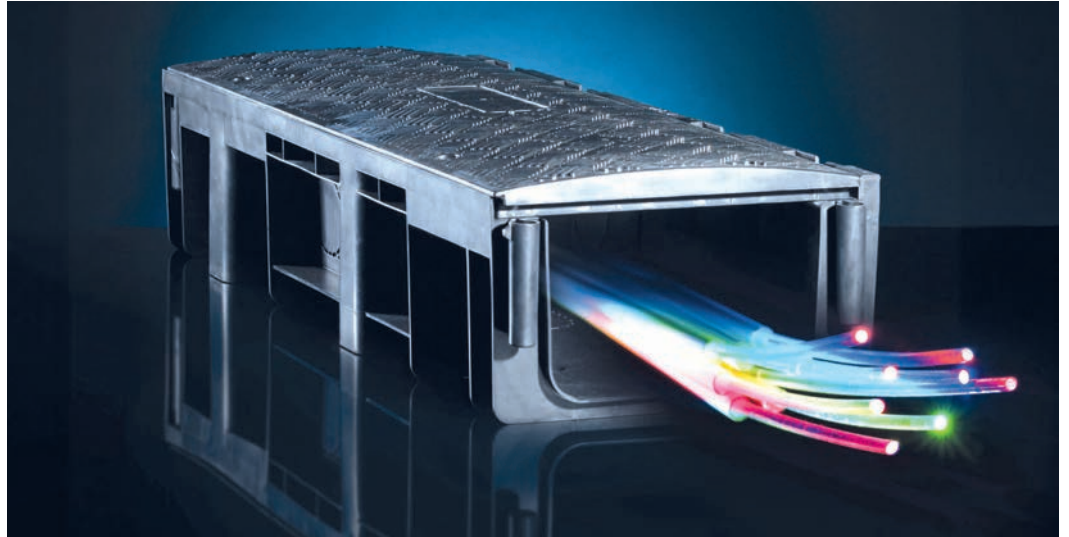


The 6.8 kg plastic cable ducts replace concrete elements weighing 160 kg. © Wirthwein



### Site Visit to Wirthwein

## The Trouble with Sustainability

The company produces its own green electricity, develops sustainable plastic solutions and circular systems and is continually improving its injection molding efficiency – Wirthwein, one of the biggest and most well-known plastics processors, is engaged in many fields of CO<sub>2</sub> reduction. If only it were not for the vague political course-setting and contradictory customer requirements.

**P**lastic neutrality? Even though very few probably know what that means, it sounds kind of likable. But when used as a hollow campaign slogan, the term can only arouse false expectations. After all, it is not a question of eliminating plastic, but of compensating for the use of new materials, for example by removing a corresponding amount of plastic waste from the environment. In Creglingen, a town in Baden-Württemberg, Germany, they know how misleading such statements can be if used without an explanation or implementation concept. More precisely, at the headquarters of Wirthwein SE, an experienced system supplier among plastics processors, which celebrated its 75th anniversary last year. The company employs over 3000 people in 22 factories in Germany, Poland, Spain, Turkey, China and the USA, and is already demonstrating its international orientation with the naming of its six business

fields: Mobility, Rail Infrastructure, New Energy, Home Appliance, Medical and Interior Design.

Background information: Bavarian Prime Minister Markus Söder's initiative, announced three years ago, for a plastic-neutral Bavaria ("to preserve our homeland"), was not followed up with appreciable action. But – as you quickly realize if you visit Creglingen – he has hit a sensitive spot with people who are fighting almost every day for the image and future of not just their company, but an entire industry. Marcus Wirthwein is one of them. The 51-year-old now represents the third generation of the family-owned company. On May 1, 2024, he moved from the Management Board of Wirthwein SE to the Supervisory Board and took over its chairmanship from his father Udo Wirthwein, who had passed away unexpectedly a few days earlier.

So Marcus Wirthwein is sitting with two board colleagues in a glass conference room and reflecting on politically instrumentalized denial of reality. "Life without plastic is simply no longer conceivable. And it would not be appropriate to the situation of many people. That also applies to packaging, the problem child of environmental policy. How many people are able to shop for fresh food every day? It cannot be the purpose of the exercise to throw

### Info

More information:  
[www.wirthwein.de/en](http://www.wirthwein.de/en)

away a kilo of spoiled meat in order to avoid incinerating a few grams of film. The CO<sub>2</sub> balance sheet for discarded foods is devastating. But it is undisputed that we must be extremely careful in how we handle the resource of plastics.”

However, this finding has not yet been converted into practical market rules, explains Thomas Kraus, board member for sales and purchasing: “With appropriate regulations, it is possible to set up a functioning cycle that allows plastics to be reused time and again according to their value – the politicians still have a lot of unfinished work to do. At present, too many factors are still working against this.” First of all, there is the lack of recyclates that could compete with virgin material in terms of price, and the reluctance of customers if they are prompted to authorize the use of a recyclate recommended by Wirthwein at a suitable point.

### **Sustainable High-Performance Parts for Rail Superstructure**

When it comes to technical parts, Wirthwein considers public debates about microplastics or marine littering to be out of place in any case. On the contrary, in many cases, “plastic is a boon,” says Wirthwein, referring to one of his flagship rail superstructure products: “In modern lines, miles of cable for energy and data transmission must be laid next to the tracks. Our PP-copolymer cable channels used for this are one meter long, easy to install, have a hinged cover for repair and weigh 6.8 kilos. The concrete elements that were originally used weigh 160 kilograms!” Kraus adds: “That means that, with our parts from production, we save over 80 percent of the CO<sub>2</sub> emissions of a concrete channel over a lifetime of 30 years in the track. In addition, there are simplifications during installation and maintenance.” The cases are comparable, since, without a CO<sub>2</sub> certificate, no manufacturer will be included in a railway call for tenders.

Variety is the key here, since the cable channels are produced with branches at all kinds of angles. The product variety of the so-called angle guide plates of glass fiber-reinforced polyamide is even more pronounced. They secure the rail against lateral displacement by dissipating the horizontal forces occurring as the train passes over into the



In modern railway lines, the plastic channels for energy and data lines are laid directly next to the track bed. © Wirthwein

concrete sleeper. “Of these plastic blocks, we produce 1500 different variants, now with tolerances in the range of half a millimeter – depending on the curve radius in 0.2-degree gradation and depending on whether they are used on track beds with gravel for freight and local transport, or on pure concrete sections for high-speed trains,” says Kraus. To supply the high-speed tracks in China, Wirthwein had entered a joint venture in the People’s Republic in 2007.

### **Identifying Potentials in Component and Process Design**

With such safety-relevant high-performance parts, quality assurance plays an important role. This starts with part design, in which the high mechanical requirements are simulated by FE methods, and ends with testing of the actual part properties. “We investigate impact strength, dimensional stability and surface roughness on the end product. And, to demonstrate the polymer chain degradation, we check the viscosity number before and after production,” explains Holm Riepenhausen, Chief Technology Officer.

All the molds for the roughly 3000 rail infrastructure articles come from the company’s own mold making department. That makes it possible to deliver spare parts over a long period. At the same time, Wirthwein is actively working to technically and economically improve new mold generations for existing series parts according to the current state of knowledge – both important sustainability aspects. In component and process design, too, efforts are being made to open up potential in this respect. For example, says Riepenhausen, by reducing wall thicknesses (without risking the loss of mechanical properties at the same time) or using thermal cameras to optimize the cycle times. Thus, the angle guide plates are already demolded while they are still hot in the interior – if you touch them, you can feel how the heat rapidly flows to the surface. After cooling, the components are conditioned for a certain time at 70°C in the water bath to prepare them for any climatic conditions. »



In rail applications, it is predominantly off-tool parts, such as this angle guide plate. The production of automotive parts is spatially separated from this because of the different requirements and logistics. © Wirthwein



Graduate engineers Thomas Kraus and Holm Riepenhausen (from left) together with the chairman of the supervisory board Marcus Wirthwein in injection molding production in Creglingen. © Wirthwein

### *Efficiency Gains of Three Percent per Year*

From the detail analysis back to the bigger picture: Despite all the political and economic contradictions, Wirthwein has committed itself to sustainability – at the levels that the company can influence. On the one hand, there is energy generation: “In 2025, the proportion of own-generated renewable energy from solar and wind power will exceed 20 percent. Our goal is to increase this share to at least 30 percent by 2032,” stresses Riepenhausen. When purchasing green electricity, on the other hand, he considers that there is a problem: The expansion of the green energy infrastructure is now lagging behind demand. “Without corresponding grid and storage capacities, we cannot achieve supply and price stability – green energy alone does not help.”

The problems with the energy market and current legislation have led, among other things, to the situation in which the purchase of CO<sub>2</sub> certificates is actually resulting in greenwashing, says Wirthwein: “If companies continue to merrily consume energy and add the costs of the certificates on top of their own prices, nothing will be gained; it is all just window dressing.” In addition, the energy mix in Germany has become a CO<sub>2</sub> polluter again, because of the recent sharp rise in the proportion of coal-fired power generation. The situation is different in Turkey: “We will operate our factory there with 100 percent solar power from our own production, because we can offset the electricity we consume in Western Turkey against the electricity we generate in the East of the country – irrespective of the point of removal.” That would be inconceivable in Germany.

The second track concerns energy efficiency. “We are seeking out the most efficient machines on the market to process the plastic. We do not rely on the manufacturers’ specifications, but measure the machines according to the standard cycle. The result is crucial for the choice of suppliers,” says Chief Sales Officer Kraus. “The saving effect of course depends on the application, but new servohydraulic machines can achieve values of well

below 0.3 kWh/kg for specific energy consumption,” adds the technical manager Riepenhausen. All other consumers in production and logistics are also connected to an energy management system in order to optimize them. “With this, we are improving our consumption situation year on year by about three percent,” says Riepenhausen.

### *Plastics, the Big Unknown*

Then comes the big “but”, the factor that Wirthwein cannot influence. “With our efforts, we cover 20 percent of our carbon footprint – about 80 percent of emissions, however, are accounted for by the materials that we process,” explains Riepenhausen. One problem is that, for many plastics, no manufacturer information for CO<sub>2</sub> is available. And customers do not ask about the company’s own know-how on CO<sub>2</sub> reduction measures in part and process design, built up over years, or, in the worst case, even ignore it. As a result, “Serious CO<sub>2</sub> accounting is not yet possible, and much potential for reducing greenhouse gas emissions remains untapped. We, the industry as a whole, still have a long way to go.”

That applies particularly to the use of recyclates, which takes us back to the beginning. “In the interests of sustainability and a fair market, we need clear regulations, uniform standards and adapted specifications, which make the widespread use of recyclates possible in the first place,” says Marcus Wirthwein. And yet – as far as emissions are concerned – that is only one possible route. Wherever possible, energy-consuming plastics (in production and processing) could be replaced with those with a smaller footprint, says Riepenhausen. In many cases, this is possible with carefully planned modifications to the component design or requirements. However, to conserve resources, higher recycling quotas are essential.

To actively contribute to building up a regional competence center for the circular economy, Wirthwein joined the joint project KARE in 2023 – together with nine other companies from the plastics industry from the region, an association (TecPart) and five research partners. The project

The axial rotor for the electrical industry, a product from the New Energy division, is used, for example, in refrigerator shelves in supermarkets. © Wirthwein



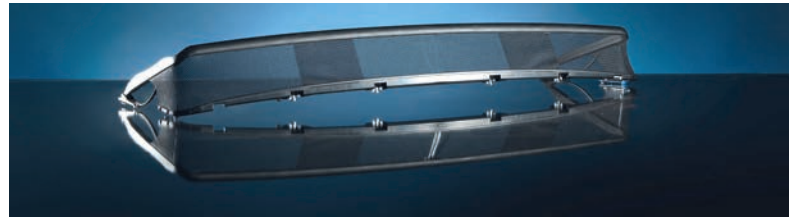


coordinator, the SKZ Plastics Center in Würzburg, Germany, describes the goal as follows: In six flagship projects, the association is to test specific solutions or application scenarios of the circular economy for important problems faced by the companies. The project is having a positive effect at all levels: Design for sustainability and digital monitoring solutions for sustainability and the circular economy, as well as waste management, avoidance of pellet losses, through to in-house recycling and use of recyclates. The German Federal Ministry of Education and Research (BMBF) is sponsoring the project to the tune of EUR 9.8 million by fall of 2028.

### *The Market Is Going Crazy*

At present, however, Wirthwein is also facing other problems. Not the least of which is to acquire skilled staff. "Unfortunately, the plastics business currently has a poor image, and the acquisition of talent has therefore become more complicated," says Wirthwein. "But we are not standing idle, we are doing school projects all year round, for example, with students, and we have founded a "MINT" association in the Main-Tauber region, in order to arouse the passion for MINT (math, science and technology) subjects with courses and many other activities for young people and young adults."

From 2023, the company also suffered sales drops of 20 percent in its two biggest business fields of household appliances and automotive engineering. The problems of the automotive industry are nothing new, but the collapse in white goods – in this case, Wirthwein mainly produces large-volume parts, such as base pans or detergent containers – came after a huge ramp-up. The background is that "During the Covid pandemic, the sales figures for washing machines, dryers, etc. went into overdrive; they were produced in unprecedented quantities. Until the market was saturated and the warehouses were full. Then the manufacturers had to order a firm production halt," remembers Thomas Kraus. Happily, they have been able to buffer this with the well-performing areas of medical technology, which is concentrated at the Mühlthal, Germany, (formerly Riegler) site, and railway infrastructure. "In this way, diversification gives us stability."



Many projects in the automotive industry have also been postponed. Not so the mass production start-up for this mesh wind deflector. © Wirthwein

However, job losses in production could not be avoided. Marcus Wirthwein has mixed feelings: "The step was necessary, since if you aren't able to maintain the personnel costs ratio, you have to pay a high price with your own competitive weakness. But we are not alone in this; the problem is familiar to the entire automotive supplier world." So what should we do? Wirthwein continues: "The environment is becoming increasingly volatile. So we must become more agile in future. But at the human resources side, that is a challenge, since development and production are not in lockstep – production volumes are becoming ever smaller, but the overheads in the indirect personnel area remain the same. A car that was previously planned with a million units is only sold 700,000 times. But the development work is the same; we have the same outlays in sales, technology and administration to manage this."

### *Strategic Course-Setting: More In-House Products*

As recently in the case of a wind deflector for a sunroof. "The application is not without its challenges," says Kraus on a tour of the machine. "We are combining a stiff metal frame, a mesh that, by contrast, is very flexible, and a closure mechanism. All three components are overmolded with plastic in one step, and the wind deflector is thus produced in one shot." As Wirthwein has defined for itself, only manufacturing "sophisticated products, not me-too products," says Kraus. And the company wants to make itself even more distinctive. "In the future, we want to produce far more proprietary products," confirms the chairman of the supervisory board. Not only in medical technology, but the first step has already been completed. Since 2023, Wirthwein has offered prefillable plastic syringes of the proprietary brand "WIM Ject." Here, too, the pandemic had an influence, says Kraus. "At that time, we noticed that there was a deficit of filling systems and syringes – after all, the vaccine became available fairly quickly." And, more broadly, the trend away from the glass syringe is continuing.

If this proves successful, Wirthwein knows from his own experience where it can lead: The cable ducts for the railway are also proprietary products and may soon experience an additional boom: as feed to solar fields and HPC charging stations for electric vehicles. ■

*Dr. Clemens Doriát, editor*

Cutlery basket for a dishwasher. In 2023, the household appliances division saw a sharp decline in sales. © Wirthwein