



PRODUCTS

# Dr. Gissel, please take it from here

Alexander Gissel, responsible for the combinatorial laboratory, analytics, processing and materials technology, keeps in touch with research, and with his team he has been a driver of innovation at Wörwag for nearly 20 years.

By Jo Berlien Illustration by Jan Bazing

Innovation – that sounds modern. However, innovation in word and deed has already existed in Zuffenhausen for a hundred years, ever since what is now Stuttgart city center was still surrounded by fields and meadowlands. The word is derived from the late Latin *innovatio*. It started to be used in the late Middle Ages, first appearing in the Romance languages and then finding its way into English later on, and it carried the meaning renewal, improvement or change. The economists only coopted the term during the 20th century. Joseph Schumpeter understood it as establishing a technical or organizational innovation in the production process. The coatings experts at Wörwag look at it this way: innovation is when you make the best coatings and are still not happy with the achievement.

When an epochal change was due just before the turn of the millen-

nium, the word at Wörwag was: Dr. Gissel, please take it from here – set up an analytics department for us! A specialist in organic chemistry, he was teaching environmental technology at Stuttgart University at the time. Nevertheless, he decided to choose Wörwag. “I had always wanted to work in a way that

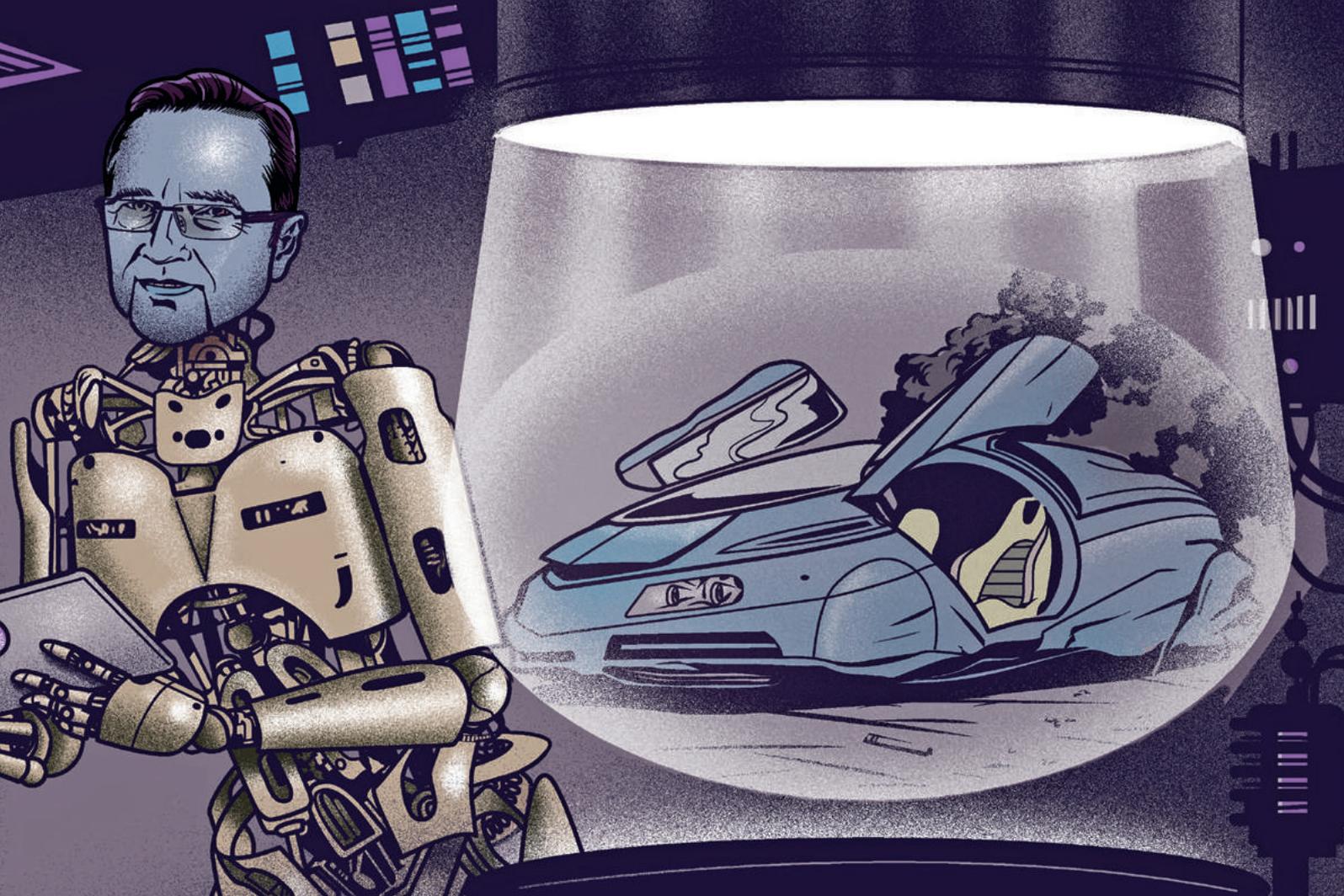
nology, materials technology and analytics departments as well as the combinatorial laboratory with a total of fifteen employees are all under his management. Gissel cooperates with scientific institutions, such as the Fraunhofer Institute for Production Technology and Automation (IPA) and the

## The goal: to recognize what the customer needs in addition to coatings.

included diversity and practical applications, to see what I developed put to use and its effects.”

Today he is one of the most important innovation drivers and operates at the interface between research and application. The processing tech-

German Research Association for Surface Treatment (DFO). He also lectures and conducts training sessions for customers, suppliers and plant construction firms at their locations. The competition is tough. The first to recognize what the customer needs besides the best



coating has the advantage. The best process, for example. Wörwag participated in the industry-wide "Green Carbody Technologies" project funded by the Federal Ministry for Education and Research and studied how energy and materials can be conserved when coating body modules separately. Gissel: "That requires a different way of thinking."

When Dagistan Durdagi started working at Wörwag 22 years ago, he operated a device with a built-in paint spray gun: "We called it the weaving automat. You hung up the sheet, pressed one of the two buttons, and that was it." The gun could only move in two directions: up and down and from left to right. "Today you can set the application param-

eters very precisely. You learn a lot, and this knowledge can also be used in other departments," Durdagi explains. A pneumatic atomizing spray gun that disperses coatings liberally is outdated. Gissel: "Overspray is unacceptable nowadays." A high-speed rotational bell with electrostatics, on the other hand, applies the coatings with a substantially lower amount of overspray and therefore delivers a higher degree of transfer efficiency. The next step, which was to avoid overspray entirely, was already tackled in the Green Carbody Technologies project to apply sharply contoured decorative strips and stripes. Similar to a printer, this technology produces droplets and secretes them separately within defined coordinates instead of using atomization.

In the future, the plan is to coat larger areas, like car roofs in series production. If a roof is supposed to have a ▶



**Coating any surface geometry perfectly.**



**Attractive:  
electrostatic  
coating of  
a plastic  
add-on part.**

Photo: Rehau

different color now, it is masked and spray painted separately. Soon the coatings in these cases will also be able to be applied and cured in one pass. Gissel joins his team to work on such research projects. The team also puts their heads together when the subject at hand concerns the exact coating technology. "To develop such tools, customers and institutes need our feedback: lots of small assays to test hypotheses. Then we collaborate on that and provide material."

Johannes Brachs has been working in the department since 2011. The Head of Technikum already wrote his bachelor's thesis under Gissel's supervision. Today the chemical engineer coordinates the daily processes, works on coating programs and is the contact person for "depicting the coating surface in the Technikum".

Important insights around the issue of "fulfilling coating specifications on different plastic substrates" are supplied by Silvie Mohr and her team. Ultimately, it is the test that always ensures clarity. Innovation also means looking beyond your own industry, comparing, adapting. Liquid coatings consist of several components, including solvents, color pigments, binders. Finding the right mixture is time-consuming,

especially as the demands on adhesion, color, effect and distribution are constantly increasing. The pharmaceutical industry first introduced

## **"Innovation also means looking beyond your own industry, comparing, adapting."**

high throughput technology, which allows a large number of mixture proportions to be created with small amounts of materials in a short time for testing purposes. The ideal components of a particular coatings recipe are found with the aid of statistical experiment design. Bosch developed and hand-built the prototype in collaboration with Wörlag, and began operations in Zuffenhausen in 2006. Michael Rosenow has been operating the equipment from day one: "No coating manufacturer ever had this before." The apparatus in the combinatorial laboratory mixes, coats, and dries. Rosenow: "The robot is lightning-quick in handling cups, scales, stirrers. The next process is already initiated when it is stirring the first order." The robot can manage 70 substrates with two coats each with-

in 17 hours, i.e. a total of 140 formulations predefined by a bar code. In comparison: a lab technician requires up to one kilo of liquid paint per mixture and manages ten formulations in a day. What counts in regard to the coating results from the combinatorial laboratory is the surface quality and measurement data. "That allows us to calculate what is possible with which coating," says Rosenow. Sabine Ansong can also draw on a wealth of experience in that regard. She co-created the process which represents the largest single investment in development. "We were the pioneers in this area for a long time," she reminisces. That should not be taken for grant-

ed, as automation's most formidable challenge is to be on the cutting edge and stay there at all times. A keen eye is required in the measurement technology department under Thomas Friedel's charge. The master of mechanical engineering measures cumbersome or curved parts, like complete car doors, by hand. Friedel is interested in the thickness of the coating, the distribution, the sparkle and the cloudiness in the shine. He lets the surface scanner take care of measuring the countless planar steel sheets and plastic panels. It works around the clock. If it comes to a standstill unexpectedly, a message appears on Ivana Matic's cell phone. She is the Group Leader for the surface scanner, the hub where all the various threads come together. Innovation never rests. ■



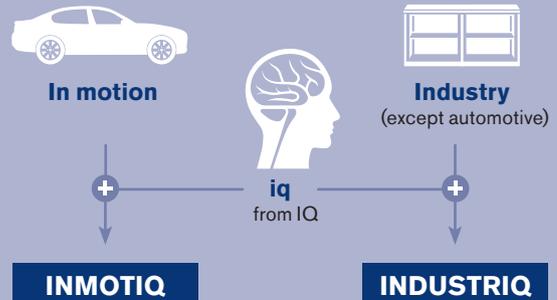
In charge of processing technology:  
Kevin Kriessler attends to the LabPainter,  
among other things.



# Coating in motion – or: decoding our product names

Wörwag sells coatings for the automotive industry under the umbrella brand name of “Inmotiq.” All its other industrial coatings are sold under the “Industriq” brand name.

## 1 The brand name is based on the application



## 2 Product

Primer    Base coat    Clear coat    Powder Coat  
more

## 3 Basis

WB (water)    SB (organic solvent)

## 4 Curing

1C    2C    UV

## 5 Type number

Type ID at Wörwag

## 6 Color code

Standard or user-specified

Example:

**Wörwag Pearl White Hydro Primer 2C**  
has been relabeled since December 2017 as:

**INMOTIQ Primer WB 2C R1472 Pearl White**

