

# Clever and smart

Industry 4.0, big data, artificial intelligence, and smart homes—the latest technological trends are also catching on in the paint and coating factory. Wörwag's product development experts are putting these innovations to use, and taking a look into the future for this issue of *finish*.

By Daniela Renzo

## Will coatings soon be developed simply by clicking a mouse?

“We'll certainly be working at the screen more in the future. Nonetheless, designers always want to have something to hold in their hands and to touch. This is why my attitude to simulation is still a rather skeptical one. At least for the time being. In ten years' time, some things will still be the same as they are now. Simulations, however, will increase in importance. They will be a decisive tool when working on creating new products. You see, we already know the pigments and color effects. The computer can calculate an effects matrix in the color space for every conceivable combination of pigments.

Our knowledge of the individual shades of color and how they change when we mix two pigments is constantly growing. We know the quantities and their effects. When I feed this knowledge into the computer, then I can simulate the complete color development process and therefore virtualize it. Doing this with visual effects is most difficult of all. Our understanding of how our base formulations interact with color pastes and effect pigments is getting better and better. Virtual tools help us to keep optimizing the results. At the end of the day, it really will only require a few simple clicks of the mouse.



**Nicole Hörner** Head of the Design, Pigments and Pastes Team

Designing the color of the car will become a standard function of vehicle configuration programs. This will allow anyone to mix their preferred type of coating at home on their computer. The technical means will be ready in a few years' time. Online tools visualize the paint in 3D. In today's light booths, it's already possible to compare a coated component with a virtually coated counterpart on the screen. The real and virtual worlds are synchronized to the extent that each motion of the real workpiece is rendered on the screen. This allows the original and the likeness to be studied from every perspective.

We will have more shades of color, and production will speed up. The customer scrolls using the mouse, and can see the color shade straight away, look at the effect in a 3D simulation, press "save" and print out the formulation. This requires a huge pool of data. This data will also include information on which combination is technically viable, and which ones no longer function. We'll stop asking whether a paint is easier or more difficult to produce and apply, and instead only ask the best way to process it.



**Jürgen Ortmeier** Director Liquid Coatings Technologies

**Dr. Alexander Gissel**  
Head of Process Technology, Materials Technology and Analysis



In the future, we won't just be selling paint in cans with a label, but rather adding a huge volume of data to every container: material, density, pigments, solids. This is what self-programming robots will be working with in the coating plants. The data are so detailed that the first coat of paint will be just right. We're homing in on a batch size of 1. Artificial intelligence will allow the robot to automatically identify the workpiece in front of it. The robot scans the part, determines which surfaces need coating, and coats it once virtually as a test before coating it for real and measuring the coating. If the coat thickness is correct, then the next component, which might be a completely different one, has its turn. To ensure all of this is possible, we've already started compiling databases. We are following all developments very closely and are also conducting fundamental research in this area.

**Will car buyers be able to mix their favorite color on their own in the future?**

**How do you teach a coating robot to think?**

In principle, this is already being done to functional textiles. But there are other trends we consider more important. Natural fibers, for example, are increasingly being embedded in the matrix for fiber-reinforced synthetics. We need to be able to offer coating solutions specifically made for this. And with the increase in electromobility, the significance of lightweight construction will grow as well. Lightweight construction means a mix of materials. A vehicle body is no longer just made of aluminum or sheet steel, but rather of many different plastics with highly varying properties. Some are hard, others flexible. We need coating systems that cure at 140°F or 175°F (60°C or 80°C). We need to develop base coats or systems for hybrid vehicles bodies, ones which can do everything.



**Dr. Markus Schmidtchen** Head of Development of Functional Paint Systems

## Will clothing also end up being coated?

## Will coating system driers soon be relegated to museum exhibits?

No. However, coatings that dry quickly at room temperature are a promising area of interest. Coatings that dry this way could have virtually the same properties as systems that dry conventionally do now. In principle, we're already able to formulate this kind of product. However, the products still have a few teething problems that we need to get under control. The greatest appeal isn't just the cost savings made possible by reducing the energy required for coating processes. There are also advantages for the workflow and in logistics. Above all, coatings like this would prove expedient when coating large items of agricultural and construction machinery. Coating a large roller compactor using today's coating systems in a cold factory hall where the temperature is just 50°F (10°C) is a huge amount of work. Once the drying process can be skipped, we'll be able to offer the customer a much larger process window. The customer will then be able to coat components to the same quality in much more flexible conditions.



**Meike Kiraly** Head of Clearcoats Development Team

**Jürgen Ortmeier** Director Liquid Coatings Technologies



Quite the opposite: there will be a lot of changes. The manufacture of paints will become more demanding. A formula devised by virtual means tells me how much of each component I need, right down to the decimal place. To ensure everything works out correctly, we need to produce with extreme precision, calibrate all physical parameters exactly, adjust them optimally, and then check them. Ideally, the customer's production and our coating manufacture will be part of a network, allowing data to be exchanged in real time. Despite the interconnected technology, humans will retain a key role.

**Will the  
art of paint  
production  
soon be lost?**

“We let our products speak for themselves. Quality doesn't need big words to make an impression. Another trump is our innovativeness.”



**Dr. Peter Moritz** CEO