



SUCCESS STORY

30 % time savings thanks to integrated quality assurance

Volkswagen foundry in Kassel is optimizing its processes with automated optical and tactile measurement technology from ZEISS

LOCATION

Kassel, Germany

ZEISS SYSTEMS

PRISMO, ScanBox Series 5

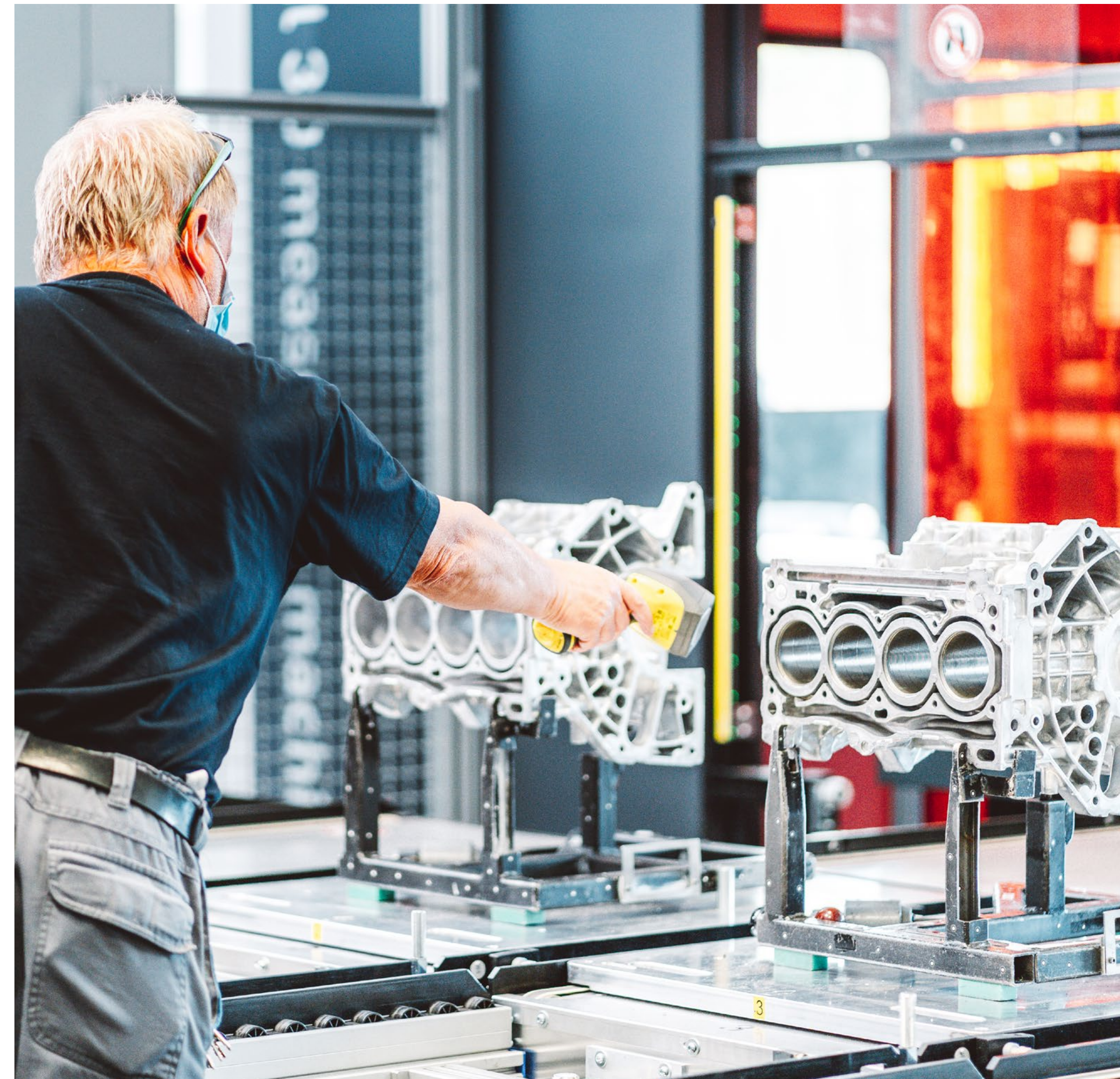
SOFTWARE

ZEISS CALYPSO, ZEISS INSPECT

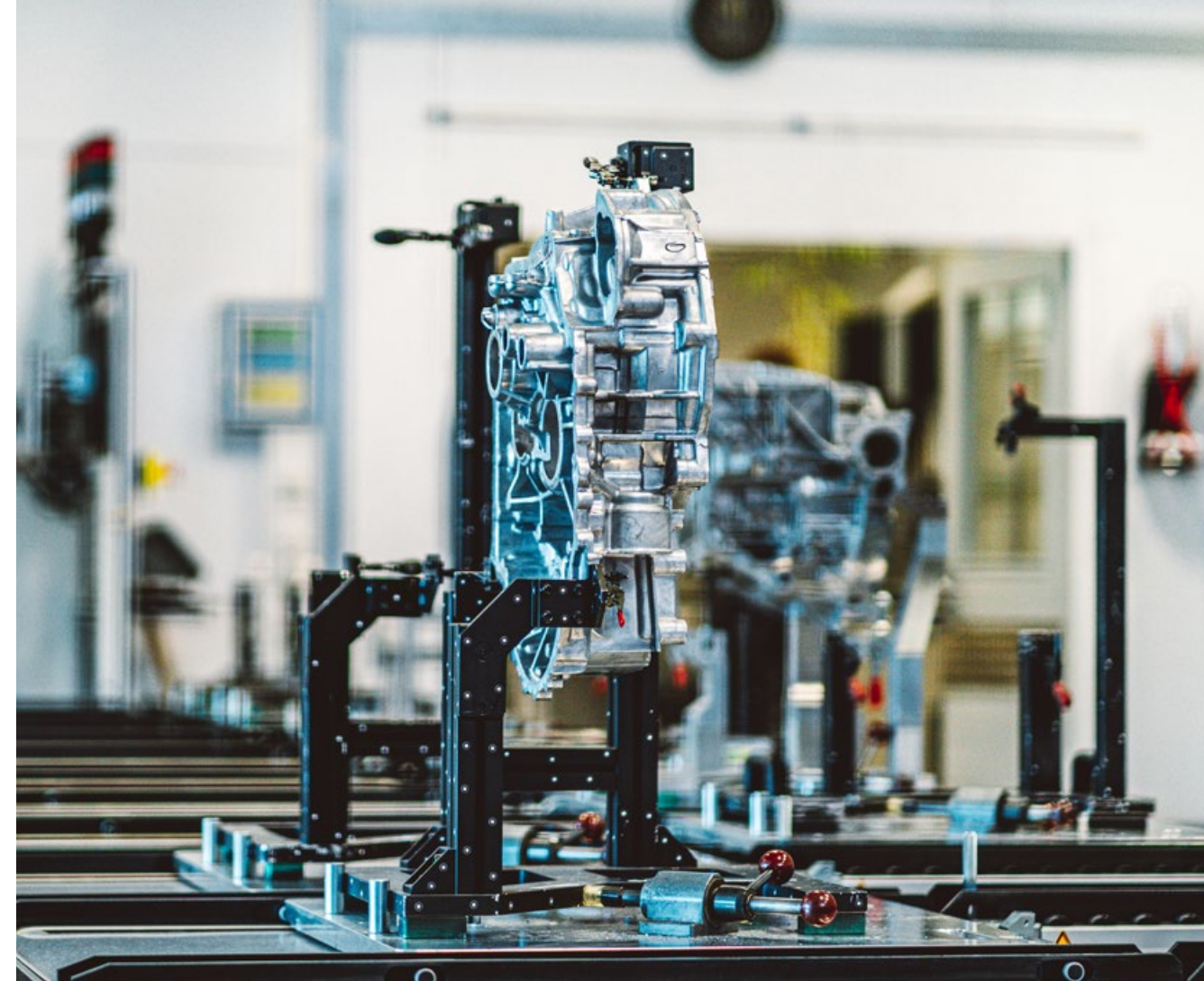
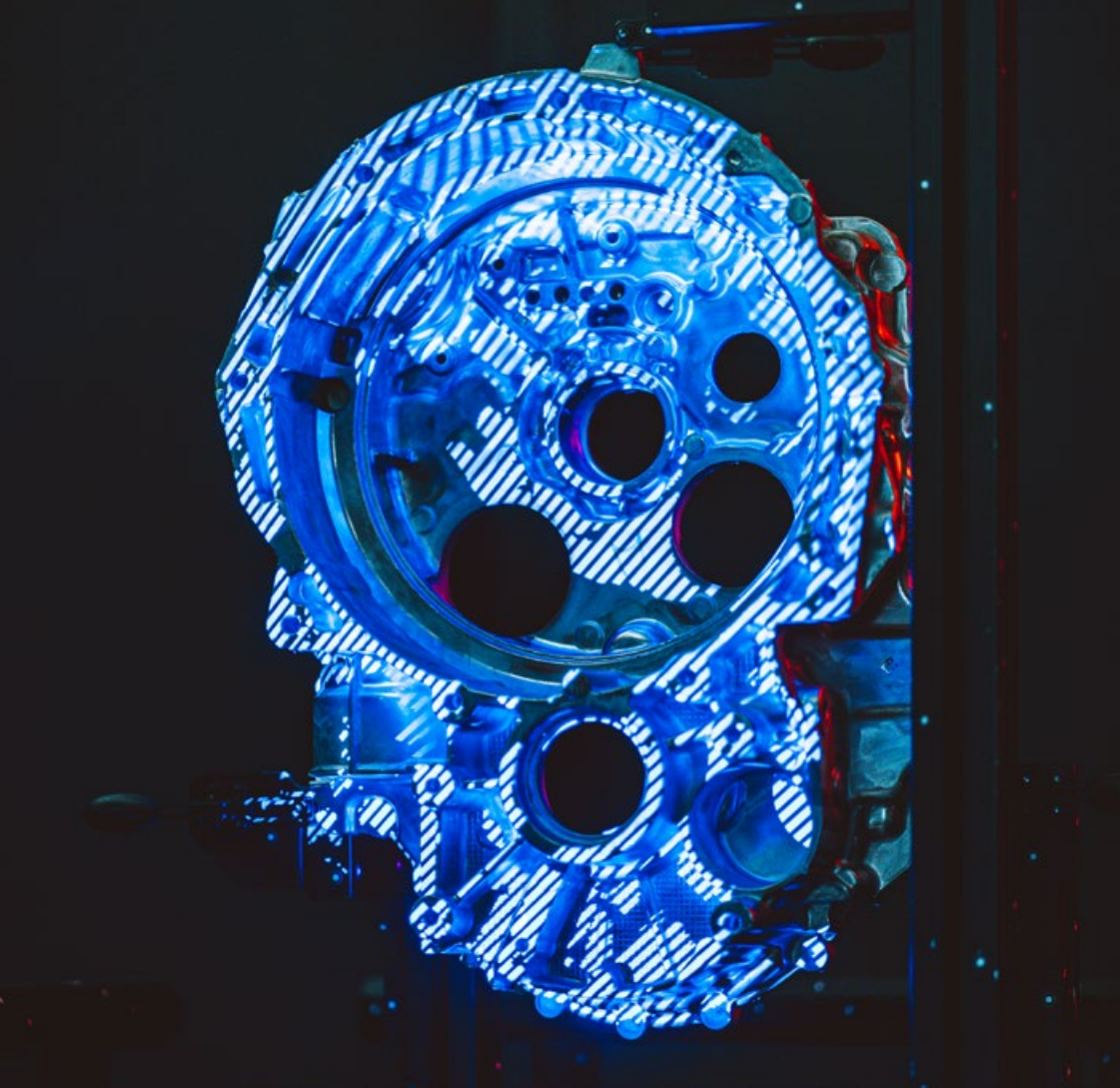
Europe's largest light metal foundry, located at the Volkswagen plant in Kassel, produces large quantities of drive and transmission components for the entire European market. The car manufacturer is optimizing process efficiency in quality assurance with tactile and optical measurement technology from ZEISS, combined with an automated loading system from the ZEISS Integration Series. The result is optimum machine utilization and more information on the components in less time, enabling faster reactions and reducing rejects.

The automotive industry is experiencing the most significant upheaval in its history. Volkswagen plans to offer 70 percent of all cars produced as fully electric vehicles by 2030. With its range of all-electric ID models, Family range, the car manufacturer is demonstrating its commitment to the transition to electric mobility. Despite this enormous change to its product portfolio, Volkswagen's commitment to quality remains unchanged. "Our components must meet rigorous quality standards, whether they are combustion engines or electric motors", says Holger Giersberg, sub-department head for quality assurance in the foundry and machining division at the Volkswagen plant in Kassel. "At the same time, we have to produce and test large quantities, which requires highly efficient processes."

Holger Giersberg, sub-department head for quality assurance in the foundry and machining division at the Volkswagen plant in Kassel



A quality assurance employee loads the part at one of the 14 set-up stations and selects the measuring plan.



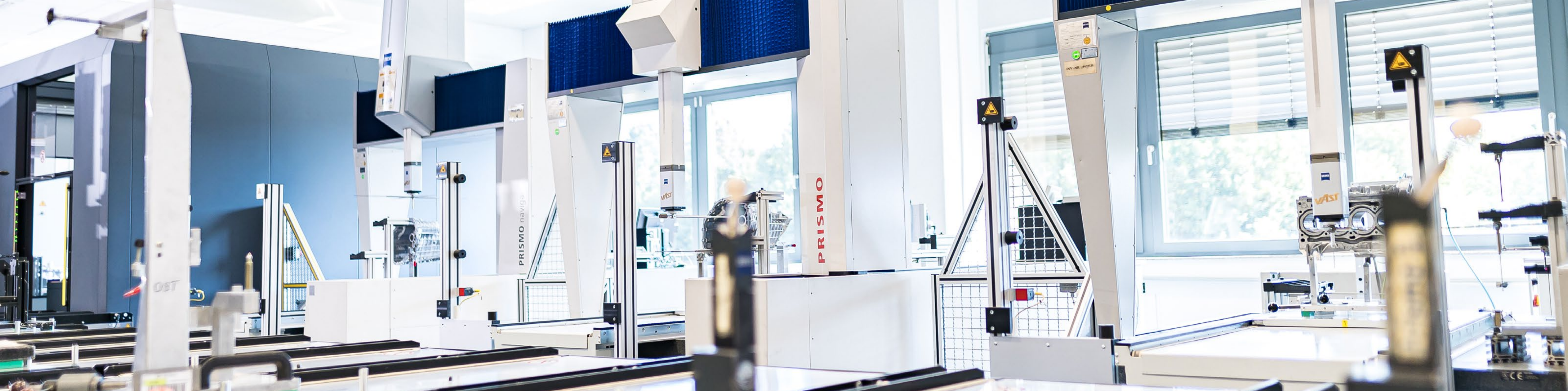
Long-standing partnership: Volkswagen relies on measurement technology from ZEISS

The foundry at the Volkswagen plant in Kassel produces cylinder crankcases, gearbox housings, and electric motor housings, among other parts. The quality assurance department inspects almost 200 delivered components every day in three-shift operation. Special measurements are also carried out on an ad hoc basis, for example at the start of production of new products.

Volkswagen in Kassel has relied on ZEISS PRISMO coordinate measuring machines (CMMs) for many years. To shorten throughput times while obtaining more information during the production process, Volkswagen has also installed a ZEISS ScanBox – an automated optical 3D measuring machine that interacts with a ZEISS Integration Series automatic loading system comprising 14 set-up stations. The results speak for themselves: “The flexible networking of optical and tactile measurement technology has increased capacity by 30 percent”, reports Holger Giersberg. “In addition, more information is now available during series production, for example about free-form surfaces. This allows us to carry out quality assurance faster and more effectively.”



The gearbox housings for electric motors are first full-field measured in ZEISS ScanBox. An automatic loading and transport system from the ZEISS Integration Series then transports them to one PRISMO CMM for tactile measurement.



In the measuring room of the light metal foundry, the loading system of the ZEISS Integration Series interacts with three ZEISS PRISMO CMMs and one ZEISS ScanBox.

Automated system combines optical and tactile measurement technology

In a large room in the foundry, the delivered cast parts are ready for inspection. First, the components undergo a visual inspection, followed by X-ray analysis. Finally, quality assurance staff measure the components using a system comprising several CMMs from the ZEISS PRISMO family, as well as the ZEISS ScanBox optical 3D measuring machine. “We inspect at least one component from each die casting machine per shift, which equates to 64 or more inspections in an eight-hour period”, explains Gerd Guhde, Quality Assurance Planner at the foundry.

Before the new, comprehensive ZEISS solution was implemented, employees had to work through their inspection plans using three ZEISS PRISMO CMMs and a manual loading system. “The process was not yet optimal because employees had to wait at the system until it was their turn to measure their workpiece.”, explains Guhde. Additionally, more extensive measurements, such as when a problem with a component arose, could only be carried out manually in the precision measuring room, which was time-consuming.

“To increase the efficiency of the process, we set up an additional station to support our CMMs with optical measurement technology”, Guhde explains. “We opted for the ZEISS ScanBox because it combines the best of both worlds in terms of cooperation with the CMMs.” Together with the ZEISS Integration Series loading system,

this has fundamentally changed the process: quality assurance employees can now load a component at one of 14 set-up stations, enter the component data via the software at one of two terminals, and select the measurement plan. The inspection process then takes place completely automatically.

First, the component is transported into the ZEISS ScanBox, where it is measured optically in its entirety. It is then automatically distributed to one of the three ZEISS PRISMO CMMs, where specific points are tactily measured. A traffic light system indicates the current status of each station.

Faster and easier to achieve a more comprehensive result

This system setup optimizes the utilization of the available measuring machines: “We can process the parts without any downtime”, says Florian Hillebold, who is responsible for CT and X-ray technology, as well as the programming technology of the new system. „Our employees can also continue their other activities without the system stopping and us losing measuring time.”

The speed and quality of the measurement results has also improved: “Another advantage is that we can quickly record important measurement data optically in a single process and supplement missing data with tactile measurements”, explains Rene Bednar, metrology inspector in the foundry’s quality assurance department. “This allows us to quickly obtain a complete measurement result for each component and recognize errors at an early stage before they have a negative impact on the rest of the production process.”

Thanks to the ability of combining all measurement technologies of the ZEISS IQS portfolio into one solution, all optical and tactile measurement results are now summarized in one report. ZEISS PiWeb reporting and statistics software with an integrated false colour display is used for this purpose. The system can also be used by employees with no metrological knowledge: “The operating effort is very low and the interface is intuitive”, emphasizes Florian Hillebold. “You can’t really go wrong and you always get a reliable result, regardless of the user.”





Optimally equipped for electromobility

Holger Giersberg, Head of Department, is relaxed about the major upheaval in the automotive industry, which Volkswagen is driving forward at the forefront.

“New models and drive technologies initially mean more work for us because we have to take special measurements in addition to series production measurements. However, with our new system, we are well prepared for this.”





The Volkswagen Passenger Cars brand has a global presence and produces vehicles at 28 locations in 12 countries. In 2024, Volkswagen delivered about 4.8 million cars. These include bestsellers such as the Polo, T-Roc, T-Cross, Golf, Tiguan and Passat as well as the successful all-electric models of the ID. family. About 170,000 people currently work at Volkswagen around the world. With its ACCELERATE strategy, the company is consistently driving forward its development into the most desirable brand for sustainable mobility.



Seeing beyond