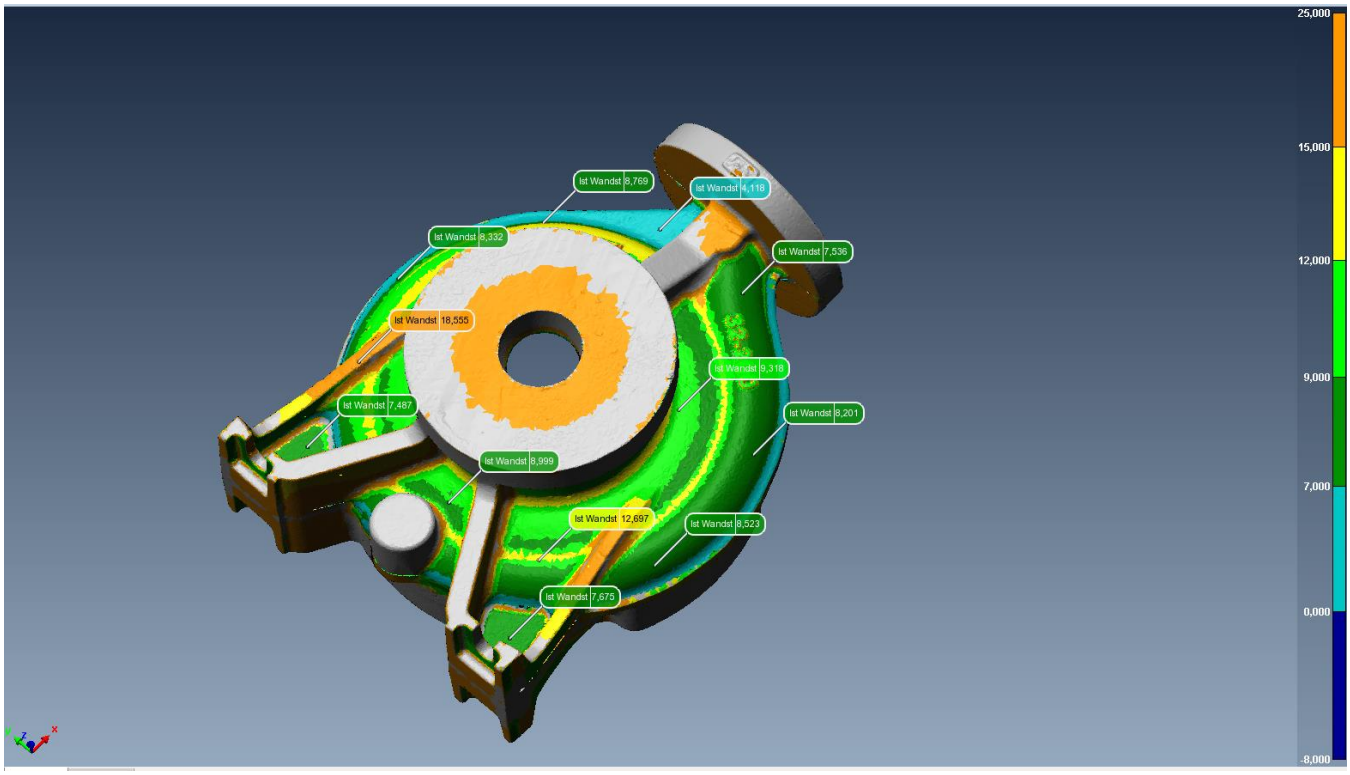
# Up to the Challenge

The pump manufacturer Allweiler in Radolfzell, Germany is using the ZEISS T-SCAN to reduce throughput times and costs

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| **SYSTEM / APPLICATION** | ZEISS T-SCAN |
| **INDUSTRY** | Manufacturer of pumps and cast parts |
| **CUSTOMER** | Allweiler GmbH, Radolfzell, Germany |

## TASK

Located just a stone's throw away from the Swiss border in Radolfzell, Germany, Allweiler GmbH is the country's oldest pump manufacturer and knows exactly what is most important these days: meeting customers' requirements down to the very last detail. The company has been producing pumps since 1860. Most of these must work flawlessly under extreme conditions, which is why materials and designs at this mid-sized company have to fulfill such demanding quality requirements. The pumps produced by Allweiler are not only designed to operate efficiently, but also to have a long service life. Achieving these goals requires outstanding manufacturing precision, so a comprehensive quality assurance system is in place to inspect each part. The key component is the nominal-actual comparison, i.e. the comparison of the manufactured part with the data set from the initial sample or its CAD data. It makes no difference whether the part is supplied by the customer or manufactured in-house. "The dimensions have to be 100% correct," explains Christian Bühring from the Process Planning department for Molding / Sales / Simulation / 3D Scan at Allweiler.

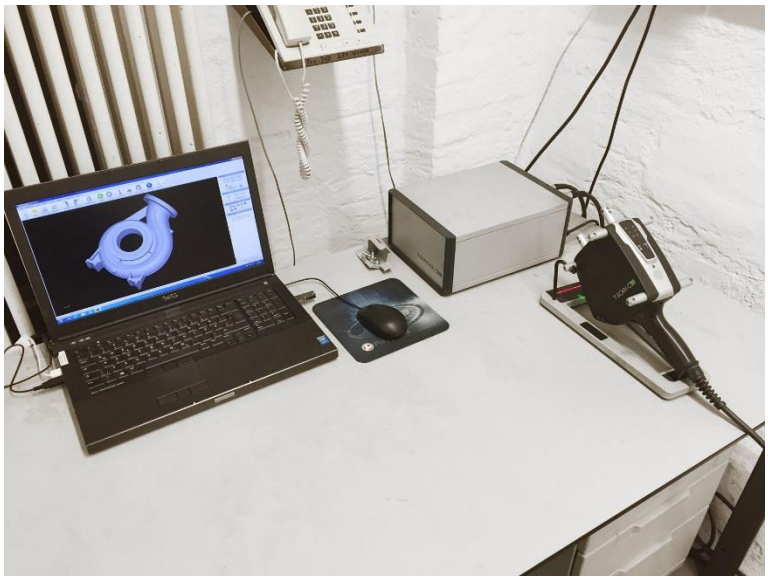
For a long time, an external service provider handled the measurements of cast parts. Yet it became increasingly apparent that outsourcing measurements was slowing down Allweiler's processes and, as a calculation of the company's costs revealed,

making them significantly more expensive. "It was clear that, in the long run, it would be cheaper to do the measurements ourselves – even if we had to acquire the necessary equipment."

## SOLUTION AND PRODUCT

The ZEISS T-SCAN stood out from the very beginning: the pump manufacturer's hand-held laser scanner will have paid for itself within just two years. Christian Bühring creates the measurement reports for Allweiler's customers and appreciates how user-friendly the ZEISS T-SCAN is. The ergonomic design means scanning is simple and intuitive. "Using this device is really easy. You have three measurement points, and these make scanning so straightforward." This also kept the time needed to introduce the scanning system at Allweiler to an absolute minimum. Within just a few weeks, Quality Assurance employees were using the ZEISS T-SCAN to perform reliable measurements without any problem.

The system comprises three components: a tracking camera, a hand-held scanner and a touch probe. Thanks to its modular design, the ZEISS T-SCAN can be set up in line with the customer's needs. This makes the system suitable for various applications, including measuring difficult-to-reach areas. The lightweight, ergonomic scanner housing is ideally suited for the technology, making measurements a breeze. The exceptional scanning speed and the precise measurement results are particularly impressive: the surface of the component is probed using non-contact measurements and at lightning speed with the laser line generated in the hand-held scanner. 210,000 points are captured every second, more than with any other standard method. Since the tracking camera detects the position of the scanner, 3D surface data can be calculated via triangulation. Contact measurements for individual points can be performed using the touch probe, enabling the metrology engineer to capture hole boundaries or difficult-to-reach areas such as recesses.

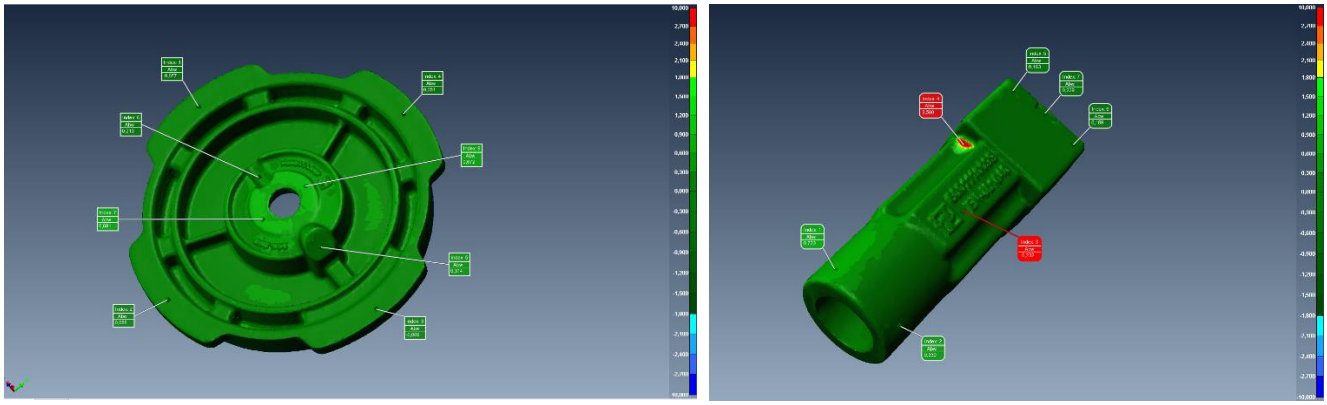


The ZEISS T-SCAN is a practical, hand-held laser scanner which does not require much space and is a great help to operators in quality assurance.

## RESULT / BENEFIT FOR THE CUSTOMER

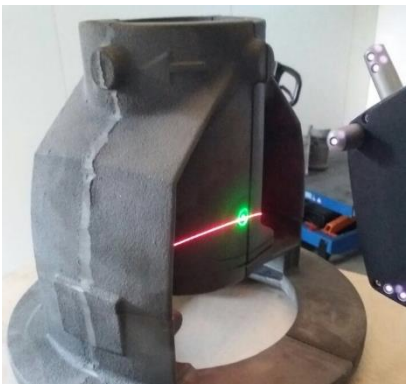
Sometimes customers require pump parts with extremely intricate designs. Christian Bühring remembers a plate with twelve individual models on top of it. All of these needed to be scanned. The most important factor was the suspension points. These were affixed to components to lift up and secure them, and needed to be balanced accordingly. Allweiler uses a wet casting process where the model is recreated using a molding material made up of sand and a bonding agent. The mold is hardened by pouring in molten metal and can shift in different directions. "When using the scanner to perform inspections, it became clear that each part had to be measured differently starting with the suspension point." This meant that there was a difference between the outer and inner shape. "Here we were able to use the scanner to great effect to accommodate these dimensions. Since then, we have not had any problems in this area." Another benefit is that the number of defects in the machining phase has been drastically reduced.

"We scan everything we cast – from a rotor or a lid all the way to the housing," says Bühring, citing some of the various components comprising a pump. "First and foremost, doing these measurements ourselves has saved us time." The company's external service provider had estimated they would need about two weeks to inspect each component. By doing on-site measurements, the throughput time at Allweiler is approximately just six hours. Allweiler passes on the time and costs it saves with the ZEISS T-SCAN directly to its customers. For Bühring, it is clear how customers benefit from these optimized processes: "They get the results more quickly and, what's more, test reports have become significantly less expensive."



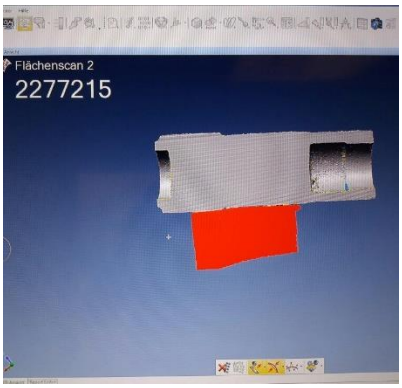
Measuring points for the test certificate of a housing cover and a barrel housing

In the future, not only will new parts be measured with the ZEISS T-SCAN, but the company will also start using the scanner for components it has been producing for years. "This is really exciting for us because we can identify wear in the casting molds early on by comparing the scan with the CAD model," says Bühring. This enables Allweiler's employees to manufacture components that correspond to the ideal first model with fewer interruptions.



Scanning a bearing bracket

Scan and CAD




Scanned section

## BENEFITS / STATEMENT

- **In-house measurements increase flexibility and lower costs**
- **Data sets are captured quickly for initial inspection**
- **Optimized production processes**

**"The ZEISS T-SCAN enables us to act a lot more quickly than before. Thanks to the precise measurements, defects in the cast parts are identified at such an early stage in the manufacturing process that the number of rejects has been reduced dramatically."**

Christian Bühring, Process Planning department for Molding / Sales / Simulation / 3D Scan, Allweiler GmbH

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