

Forging success

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Abstract

Always use the latest production technology: Aluline, a manufacturer of aluminum components and solutions from high-wage country Denmark, has operated on this principle to excel on the global market. In order to stay competitive and up to date, the family-run company is intensely focused on process innovation and also updates its measuring technology on a regular basis: the Danish enterprise recently introduced two ZEISS ACCURA coordinate measuring machines with a new scanning probe. This made the company not only the first in Scandinavia to rely on this technology, but also allowed it to reduce measuring times by up to 70 percent.

KEYWORDS: measuring machine, scanning, measuring accuracy and time, aluminum parts

„The competition has always been tough, even back in the 1960s,” says René Schow Jørgensen, Head of Aluline A/S. „Today, it’s a different type of competition. What used to be a regional competition has become global.“ Together with his brother Morten Schow, he runs the company founded by his father in 1965. The 110 employees manufacture aluminum components for various industries from the small town of Tølløse. The company covers the entire manufacturing process – from design to all processing steps to the finished part (see box).

Precision for high-end loudspeakers, prosthetics and locking cylinders

A total of 11-12 million items comprised of around 300 different parts for various applications leave Aluline every year for destinations around the globe. The company’s customers hail from the medical technology, telecommunications, consumer electronics, defense, automotive and aerospace industries. „Most of our customer have one thing in common: they demand the utmost precision, particularly because many parts will be visible to end customer,” explains Schow Jørgensen.

For example, flawlessly machined aluminum rings for loudspeakers featuring a carefully engraved brand logo help a high-end product stand out from a mass-produced article. Precision has a direct effect on the functionality of products such as prosthetics or valve housings for doors. For example, if the production tolerance for the

diameter of a locking cylinder of just 0.1 mm or the roundness is not met, there is a risk of oil leaking of the door not opening and closing properly.



Fig. 1. A total of 11-12 million items comprised of around 300 different aluminum parts for various applications leave Aluline every year for destinations around the globe

To achieve maximum accuracy and meet the rising demands of the market, the company regularly replaces its machines. Schow Jørgensen: „We have been using CNC machines since 1975, and yet the average age of our CNC machines is less than 5 years“. The mid-sized company, which counts several global market leaders as its customers, also set the standard when it comes to measuring technology: „With our measuring equipment, we want to be better than our customers, or at least at the same level of technology,“ states Jørgensen. Therefore, he and his colleagues decided in 2013 to replace their two 12-year-old ZEISS PRISMO measuring machines with newer models despite being fully satisfied with the systems.



Fig. 2. From design to all processing steps to the finished aluminum part, the company covers the entire manufacturing process at its headquarters in Tølløse, Denmark

They chose the ZEISS ACCURA bridge type measuring machine because its measuring accuracy of yet to be added by ZEISS provides the desired precision as well as the possibility of scanning workpieces continuously instead of capturing single points. Furthermore, employees were already familiar with ZEISS CALYPSO measuring software. Management and the measuring technicians also expected the new contact XTR scanning probe to simplify and accelerate the quality assurance of geometrically complex parts without sacrificing accuracy. Because a rotary axis is integrated into the probe, the stylus system can turn as far as possible in 15 degree increments and thus always be positioned at the right angle to the part.

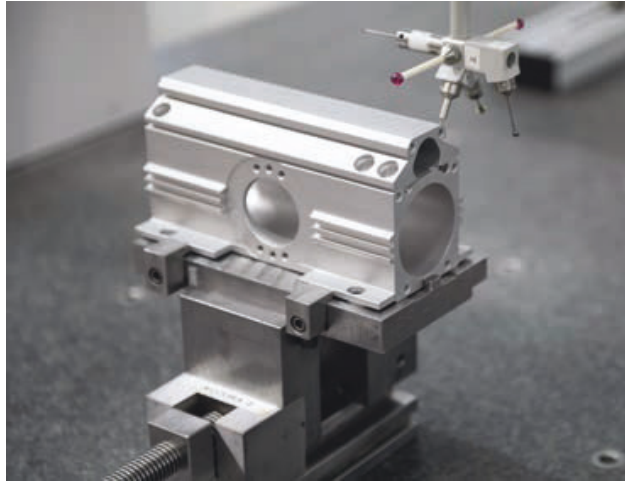


Fig. 3. The XTR scanning probe can always be positioned at the right angle to the part

Measuring time reduced from 35 to 11 minutes

The two coordinate measuring machines will enable the Schow brothers to meet their ambition of having the same or better measuring technology than their customers: „There are simply no questions asked when we show new customers our measuring lab. They know that we measure accurately and manufacture precisely.” But that is not enough: thanks to the new contact probe, Aluline now measures geometrically challenging parts without having to change the sensors. In the past, employees needed 35 minutes per workpiece to measure the 128 defined feature of a valve housing. The part had to be turned manually three times for the sensor to capture the boreholes from all angles. The XTR probe, as well as a fixture specially developed by ZEISS for this workpiece, enable Aluline to considerably reduce the measuring time without sacrificing precision. Schow Jørgensen: „We can now measure the workpiece in just 11 minutes instead of 35 – and that in a single run.“ Because the part no longer has to be turned, employees can use the time between the start of the program and reviewing the measurement report for other tasks while the machine independently makes the entire measurement. With some 30,000 items annually for this product alone, this improvement has had quite an impact.



Fig. 4. Aluline produces 30,000 valve housings every year. High precision is vital to ensuring the functionality of the valve housing

Another benefit for Aluline is that the workpieces can now be scanned continuously. As a result, measuring technicians receive a lot more information about the geometry of the parts than they did with single-point measurements. They are therefore able to provide valuable feedback to CNC-technicians and engineers

A tricky operation

In general, both measuring machines now run 24 hours a day: the measuring technicians use them to monitor the production startup of all aluminum components. Furthermore, the machine operators take random samples every two hours. Following the measurements, the results are automatically transferred to the measurement documentation.

According to Schow Jørgensen, the introduction of new measuring technology was well worth the investment for the family-run company. However, the switch to the new measuring machines caused him a few headaches in the beginning. This was not the result of the new technology, but the timing of the change-out: because the measuring machines were essential to production, the switch had to be completed during a three week plant shutdown. „Switching out the machines in such a short time was a tricky operation,” says Schow Jørgensen. During these three weeks, the old machines had to be picked up and the new ones set up in their place. However, this was not the only hurdle: at the end of the three weeks, the measuring programs for the most important workpieces had to work on the new machines. The measuring technicians specially trained by ZEISS were able to use the same measuring software that they were familiar with. However, in order to utilize the potential of the new measuring machines and the probe, it was not possible to transfer the programs one to one. „But even this process went off without a hitch.” reports Schow Jørgensen. By the end of the plant shutdown, the new machines and the measuring programs were up and running for the most vital parts. Production started as scheduled. And management once again determine that „Our drive and courage to renew our technology was worth the investment.”



Fig. 5. With the new probe, Managing Director René Schow Jørgensen (left) and Quality Manager Lars Andresen (right) achieved their goal of simplifying and accelerating the quality inspection of geometrically complex parts

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