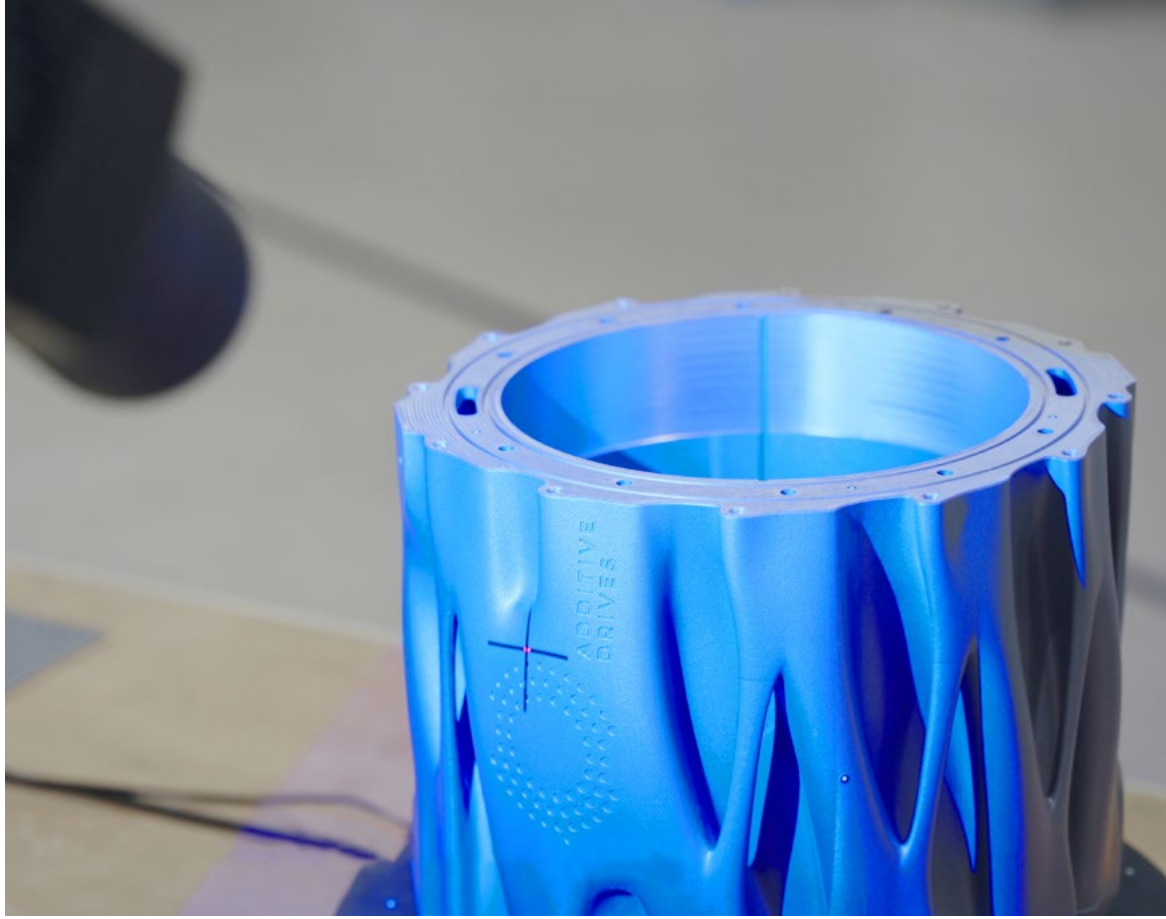
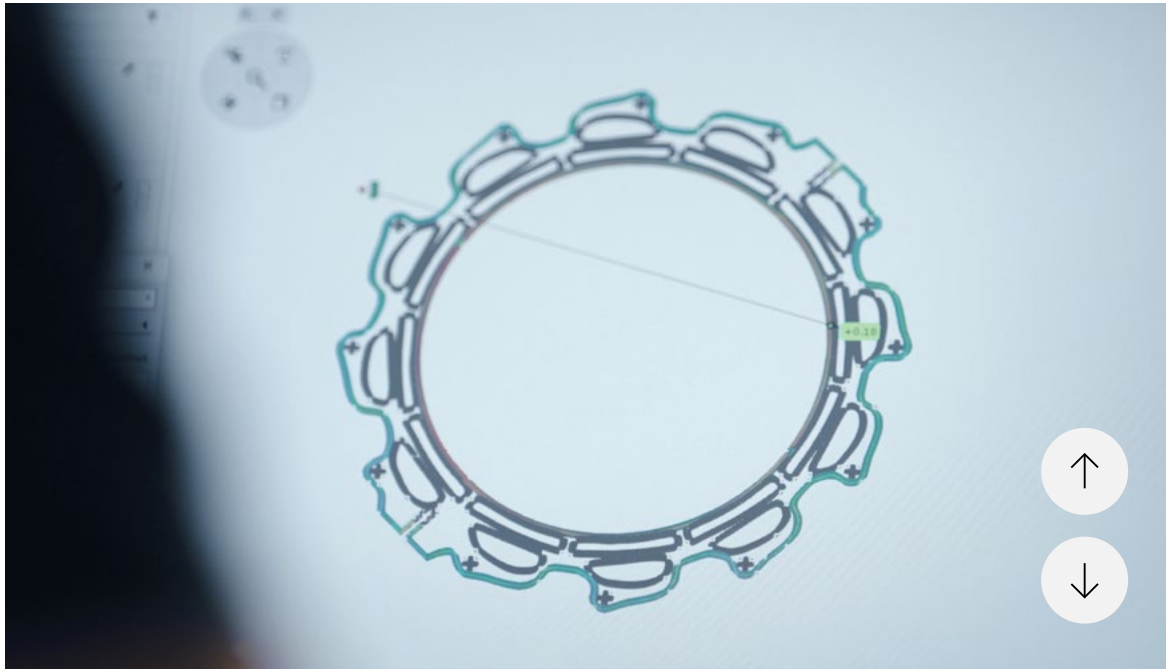
#**HandsOn**Metrology

CUSTOMER REPORT

3D scanning and the future of electric motors

Additive Drives is developing innovative electric motors. By using modern technologies, the company is taking electric drives to a whole new level.





Content

Click to navigate

With speed and precision: 3D scanning solution speeds up prototyping and production

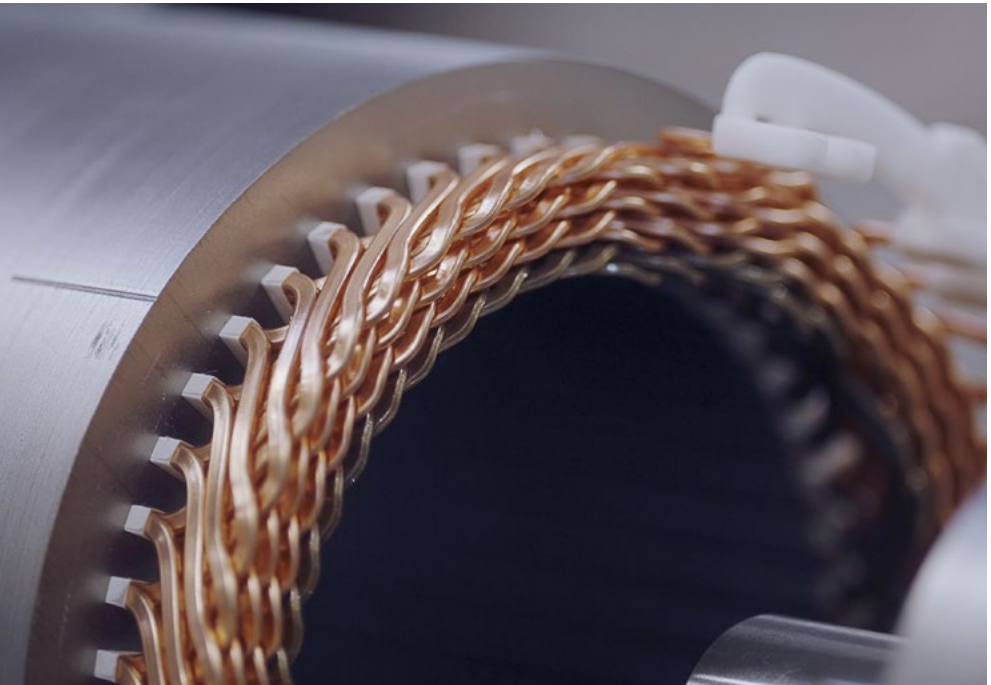
A new generation of electric motors

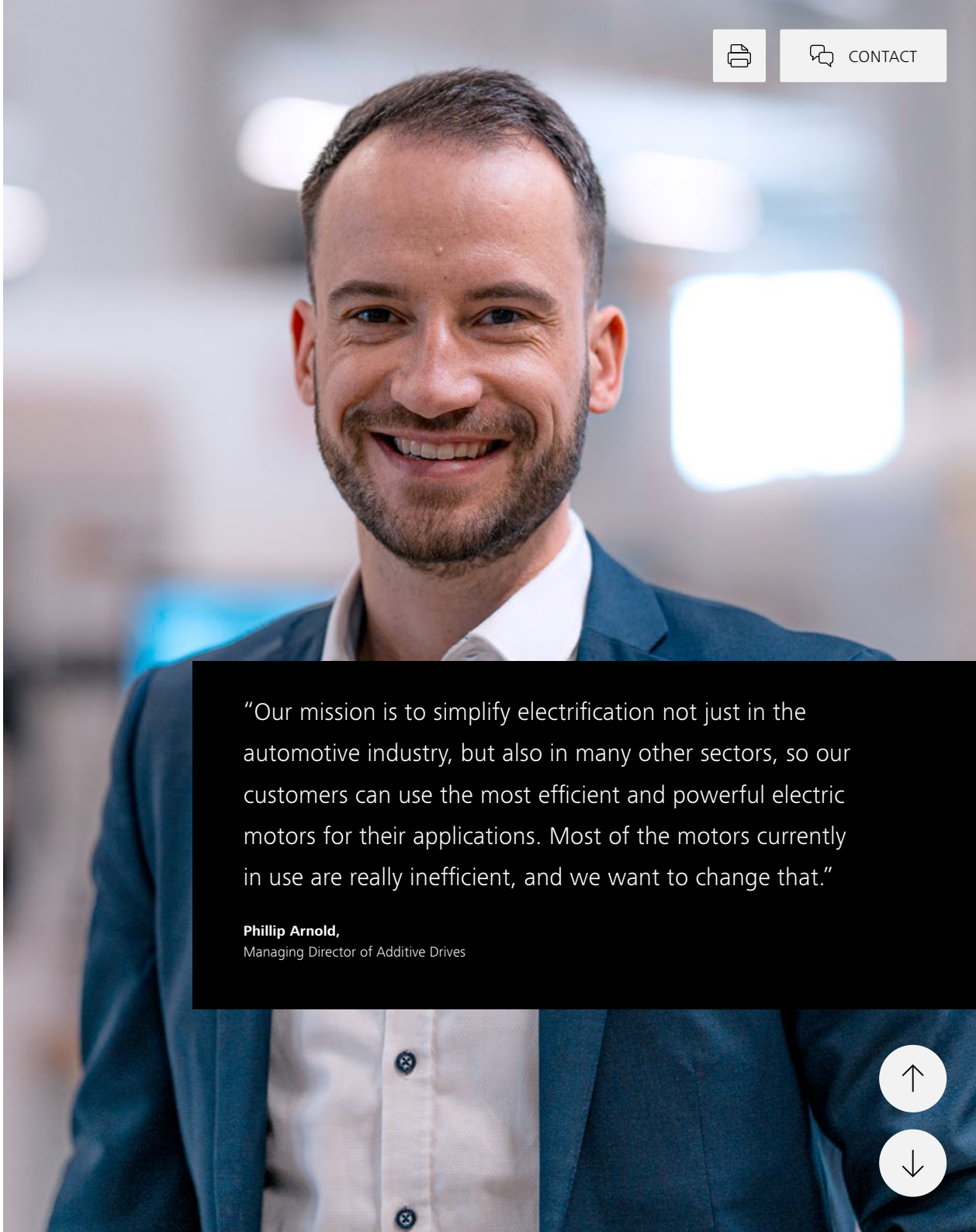
The market for electric motors is growing fast. Right now, electric motors already use about 45 to 50% of the world's generated electricity. Typical applications include pumps, fans, manufacturing drives, and increasingly electric mobility.

The team at Additive Drives from Dresden started with the mission to simplify electrification. Now, the company's highly efficient drives are used in all kinds of products. They're custom-made for every application. With an increased performance of up to 45%, Additive Drives is taking electric drives to the next level.

Globally unique production

Additive Drives has quickly made a name for itself with 3D-printed e-motors as the fastest prototyping company in the world. The team is now focused on delivering complete electric motors for demanding markets.





"Our mission is to simplify electrification not just in the automotive industry, but also in many other sectors, so our customers can use the most efficient and powerful electric motors for their applications. Most of the motors currently in use are really inefficient, and we want to change that."

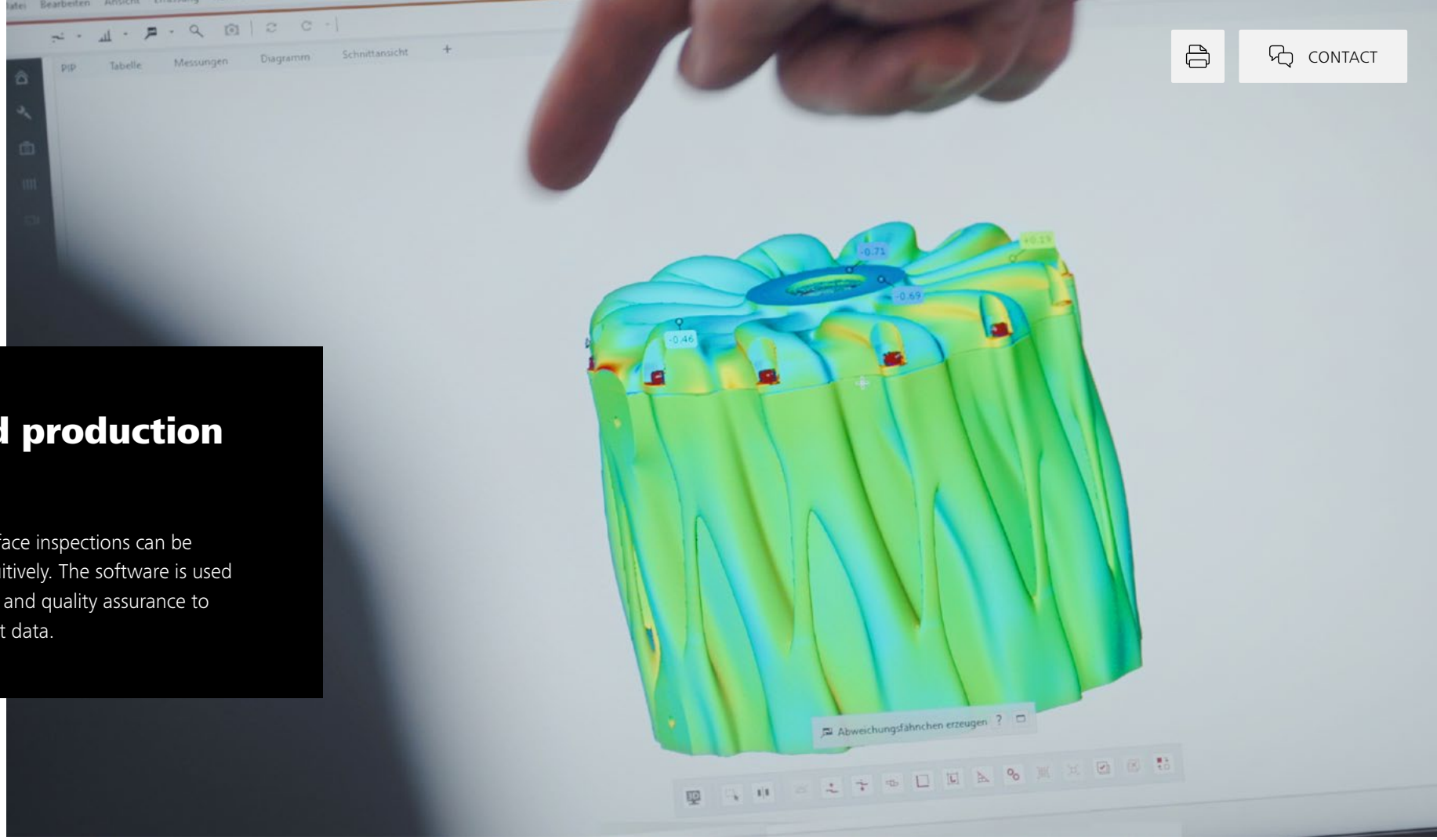
Phillip Arnold,
Managing Director of Additive Drives

The application at Additive Drives

Innovative manufacturing processes and patented technologies help Additive Drives to produce not just individual components, but entire motors in just a few weeks. Tools and prototypes are tested using the 3D scanning solution ATOS Q.

The fast and easy-to-use optical 3D measurement system ATOS Q plays a crucial role in the company's dynamic workflows. Every tool and prototype is checked on the same day it's made.

If any changes to the geometry are needed, they're implemented overnight with 3D printing, and shortly after, the revised part is ready for product development.



Accelerated production processes

With ZEISS INSPECT, surface inspections can be visualized easily and intuitively. The software is used in product development and quality assurance to inspect 3D measurement data.

Product development

The ATOS Q 3D scanner quickly captures quality information with a high level of detail, providing a reliable basis for the necessary iterations on tools and prototypes.

Quality control and quality assurance

ATOS Q allows for traceable measurement results even in tough conditions. The Triple Scan principle makes it perfect for quality checks on hairpins and stators.

3D inspection

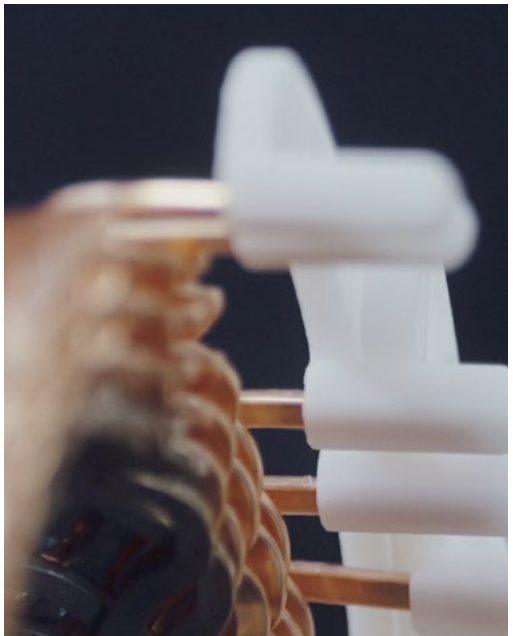
The 3D measurement data captured by ATOS Q is visualized and analyzed in the user-friendly all-in-one software ZEISS INSPECT. This helps identify sources of errors early on.

Fast measurements with the highest precision

ATOS Q makes quality checks in the production process of electric motors more efficient. Hairpins and stators are fully digitized before assembly, even without surface treatment.

Precise, full-field 3D data with high detail resolution is the basis for comparing the actual data of the stator with the target data from the CAD model during inspection. Deviations and defects can be quickly and reproducibly identified through a surface comparison.

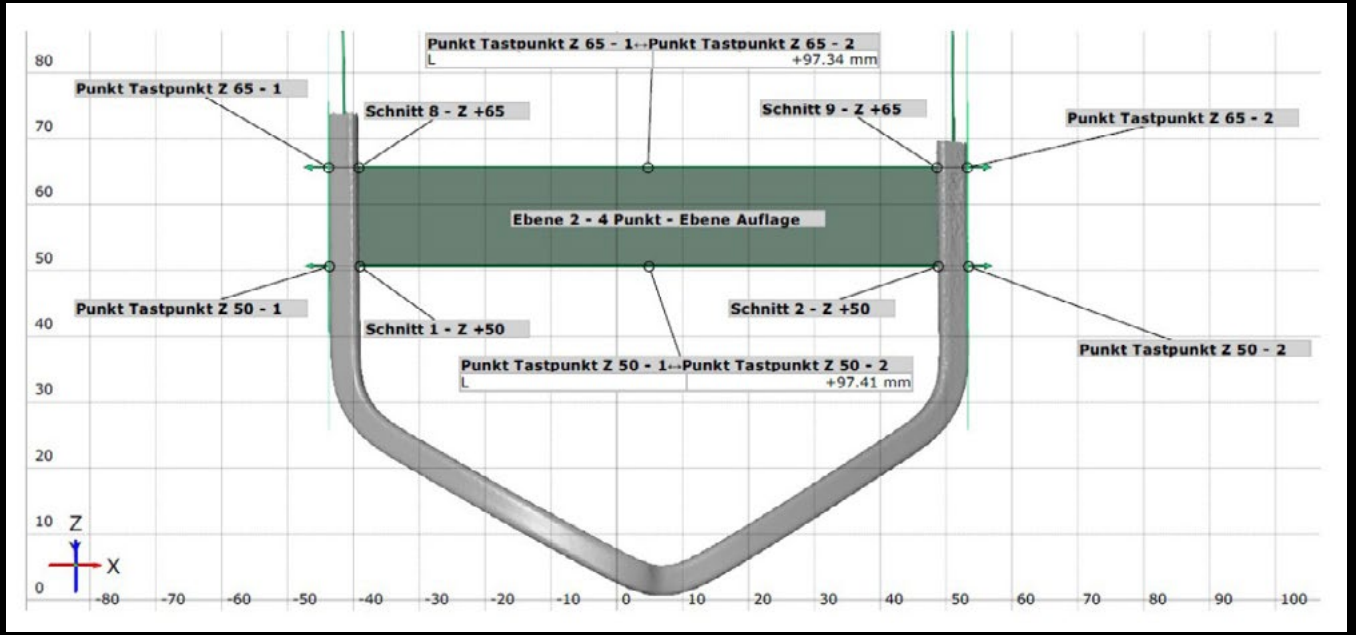
Hairpins have a flexible structure and are coated with a sensitive layer of varnish. ATOS Q inspects single or multiple hairpins in no time, digitizing both the insulated areas and the shiny stripped copper ends.

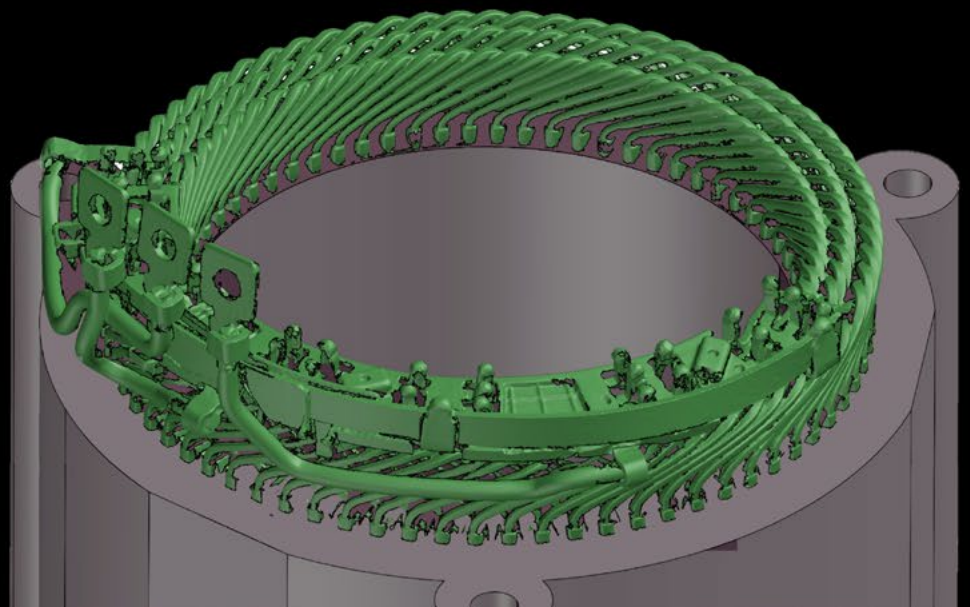


Making quality visible

Scan, inspection, and reporting all in one: ZEISS INSPECT supports the entire workflow. The metrology software imports CAD data, creates polygon meshes from point clouds, and performs 3D inspections.

ATOS Q digitizes complete tools and prototypes. ZEISS INSPECT uses distributed 3D measurement points to create a complete geometric digital twin of the parts. With a target-actual comparison, the inspection reveals the surface deviations between the 3D measurement points and the CAD data.

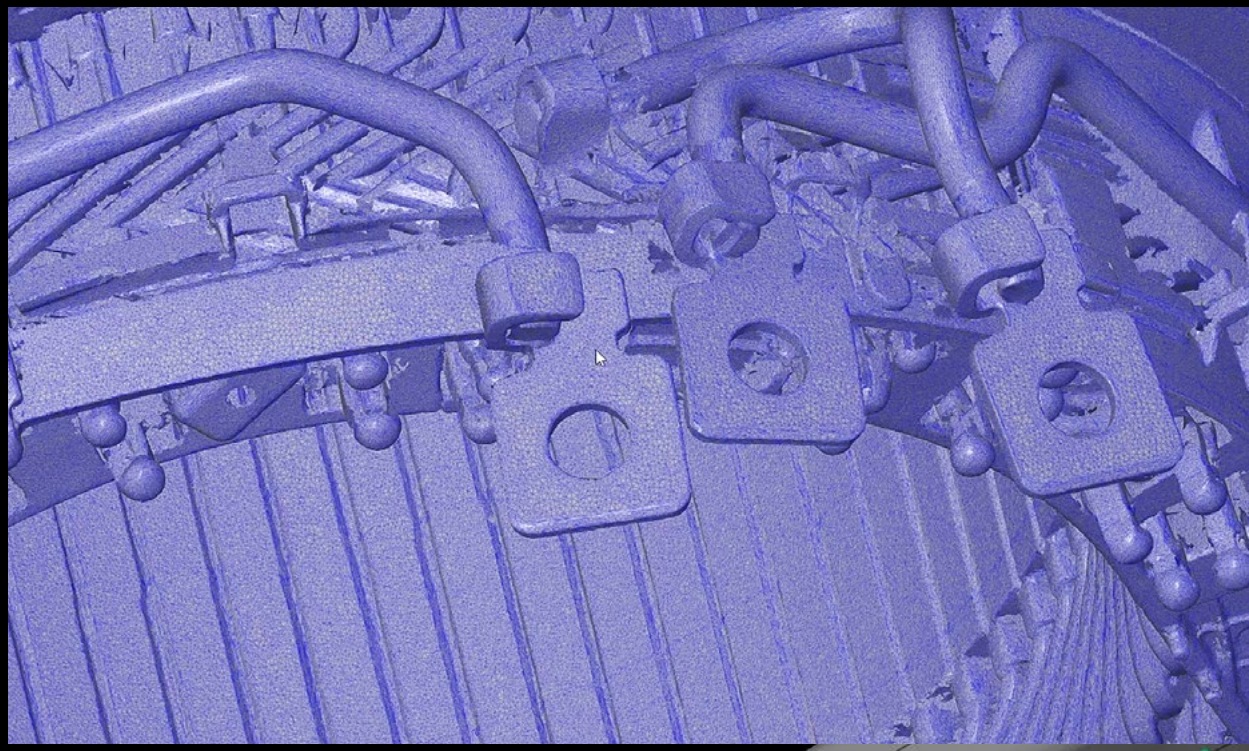


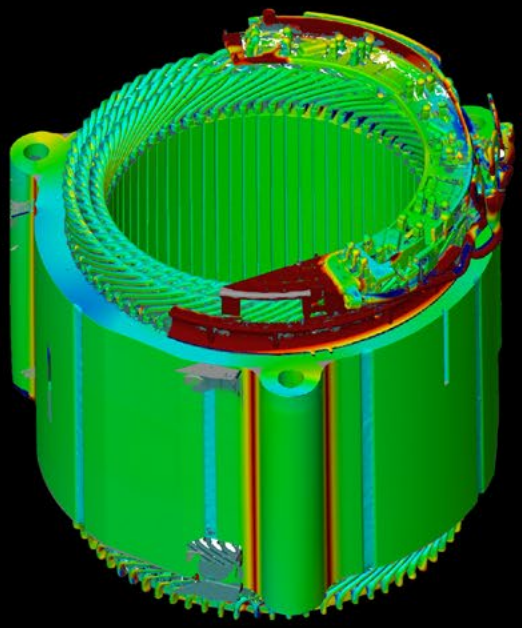


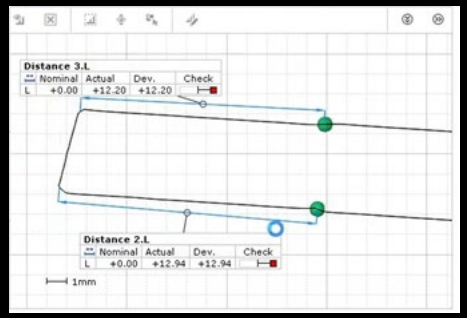
Detailed analysis of 3D data

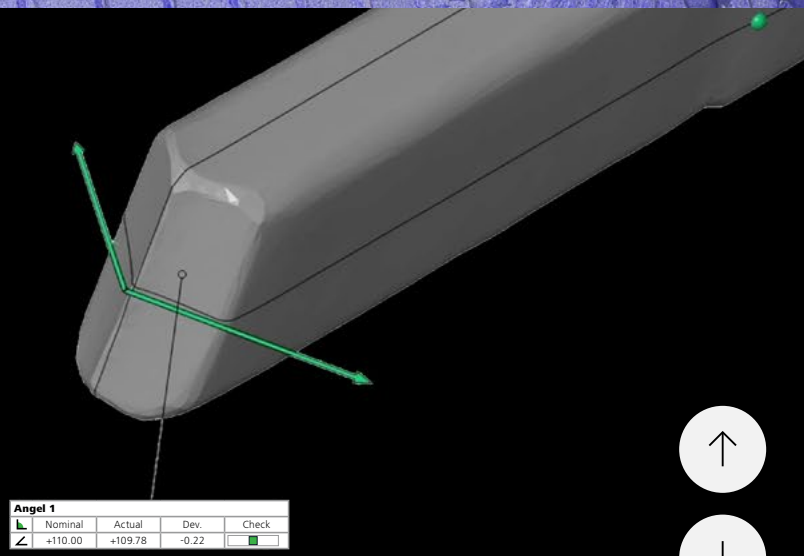
No matter how complex the task or challenging the surface: ATOS Q combined with ZEISS INSPECT makes scanning and inspection a breeze.

Typical inspection features in the quality assurance of tools and prototypes include form and position deviations. For stators, for example, the insulation, winding basket, exposed copper ends, or the laminated core are checked. The flatness of the end faces and the roundness of the inner cylinder are also analyzed.









ATOS Q

The versatile 3D scanning solution for the industry

Equipped with cutting-edge technology

ATOS Q quickly captures quality information with a high level of detail, providing a reliable basis for data analysis.

Extremely versatile and ready for any challenge

The robust optical 3D scanner ATOS Q is versatile: it handles complex measurement and inspection tasks manually and semi-automatically.

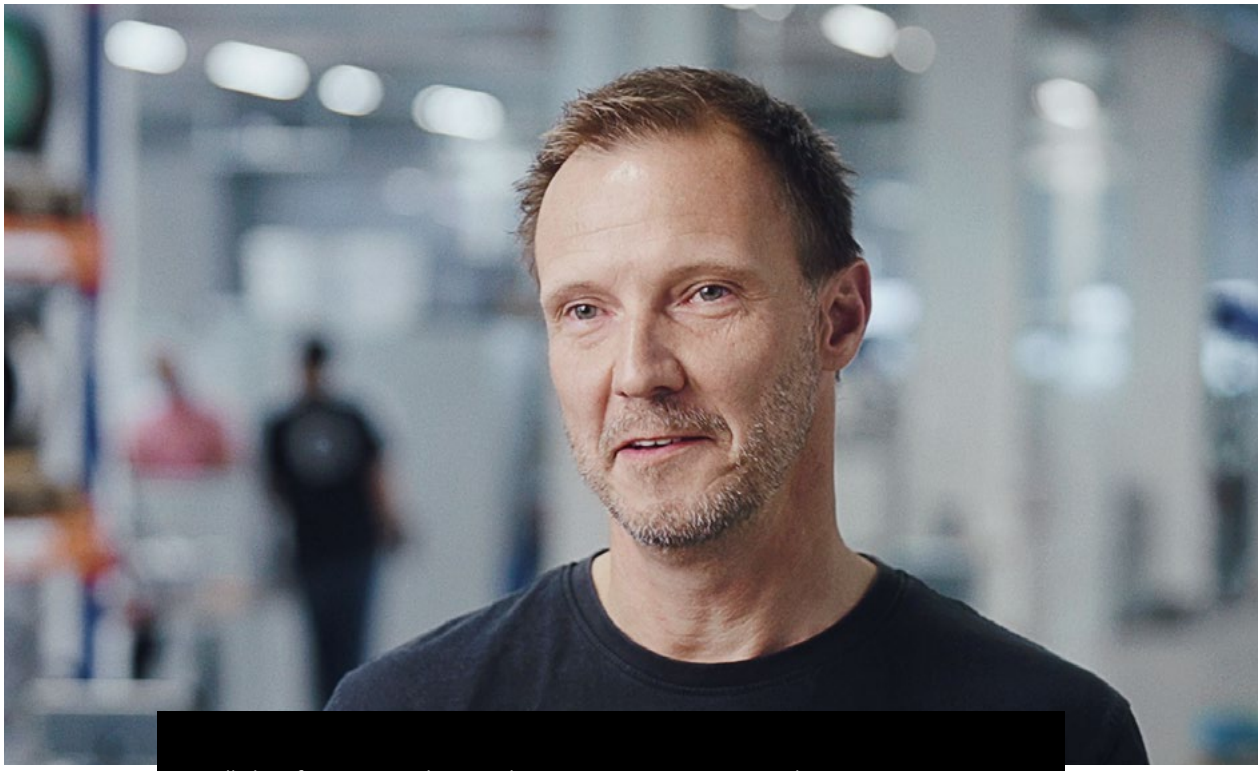
Specifically designed for the industry

ATOS Q is ready for use in the production environment. The optics and electronics of the compact 3D sensor are dust and splash-proof.

Fast results, exceptional performance

ATOS Q works with Blue Light Technology, which ensures precise and repeatable measurement data in very short measurement times. Up to 12 million data points are captured per scan. A Blue Light Equalizer enables high-speed fringe projection.

Interchangeable lenses ensure highly precise measurements of small to medium-sized parts. Weighing only 4 kg and with a compact design, ATOS Q is lightweight and easy to move. It can be used semi-automatically with a tripod and turntable, motorization kit, or in combination with ZEISS ScanPort.



"The fantastic thing about 3D scanning with ATOS Q is that it's incredibly fast. This allows us to check and adjust our tools and prototypes in no time."

René Tropschuh
Head of Quality Assurance at Additive Drives

Technical specifications

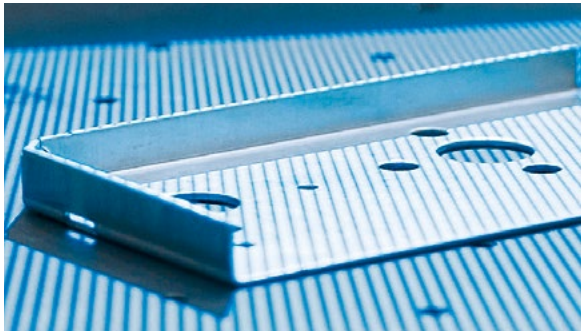
	ATOS Q 8M	ATOS Q 12M
Light source	LED	LED
Points per scan	8 million	12 million
Measuring area [mm²]	50 × 35 – 500 × 370	50 × 35 – 500 × 370
Point distance [mm]	0.02 – 0.15	0.01 – 0.12
Working distance [mm]	490	490
Weight	approx. 4 kg	approx. 4 kg
Dimensions	approx. 340 mm × 240 mm × 83 mm	approx. 340 mm × 240 mm × 83 mm
Cable length	10 m fiber optic cable	10 m fiber optic cable
Operating system	Windows 10	Windows 10
Measuring volumes	50, 100, 170, 270, 350, 500	50, 100, 170, 270, 350, 500

Versatile use cases

ATOS Q not only speeds up quality assurance for additively manufactured components in product development and launch phases. It also meets high measurement requirements in many other industries and manufacturing processes.

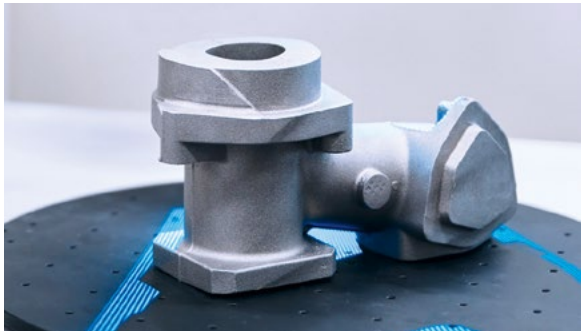
Plastic manufacturing

ATOS Q speeds up all phases of injection molding, blow molding, and thermoforming processes. Even the smallest details can be evaluated and used to determine correction values, such as for tool geometry (sink marks, warpage, and shrinkage), as well as machine and process parameters. This ensures production control while minimizing waste and rework.



Metal forming

The non-contact measurement system ATOS Q is used in sheet metal forming processes to ensure consistent quality assurance from tool testing and initial sample inspection to series production control and assembly analysis. Even sharp features like laser cuts and hole patterns are measured precisely. The measurement results provide immediate feedback on part quality.



Casting processes

ATOS Q optimizes quality assurance in sand, die, or precision casting processes. In tool testing, ATOS Q digitizes the entire cast part. By comparing the full-field measurement results with the CAD data, deviations become visible, speeding up mold correction and testing. Using the Triple Scan technology, the sensor even captures hard-to-reach areas.

Experience ATOS Q

Mobile, versatile, and precise: ATOS Q ensures quality across different industries. The compact 3D scanner is ready for use in your application too.

Designed for complex measurement and inspection tasks, ATOS Q meets high metrological requirements. Combined with ZEISS INSPECT, it is a fast and easy-to-use 3D scanning solution.

Want to know more?

Reach out to your local #**HandsOn**Metrology partner.

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