

SUCCESS STORY

66% Reduction of In-Process Inspection Time

Automated Quality-Assurance
Technology at A7 Intégration

Location

Granby (Quebec), Canada

ZEISS Systems

ScanBox 4105, ATOS Q, ZEISS DuraMax, ZEISS ACCURA

Software

ZEISS INSPECT Optical 3D, ZEISS INSPECT Airfoil

Company's field of work

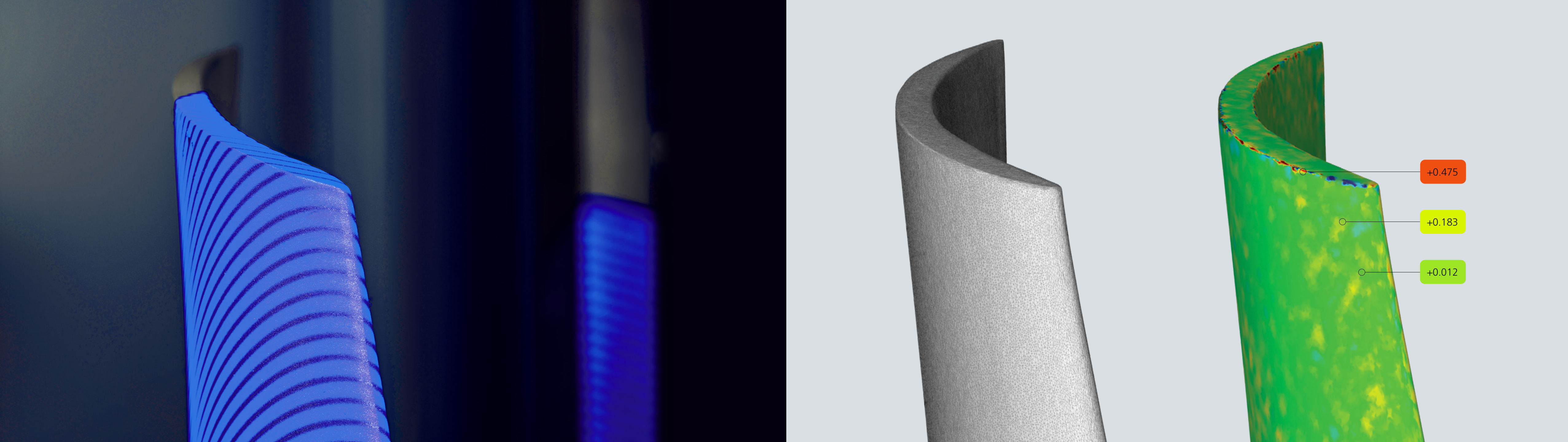
Aerospace

Powered by precision

The fact that air travel is the safest form of transportation has much to do with the exceptionally high quality demands that aircraft parts must fulfill. For example, up to 1,500 inspection features of a turbine blade may have to be verified before a supplier even gets the go-ahead for starting the initial production of this part (FAIR). Tight tolerance ranges must be adhered to in every single key step of the production process.

To meet these sophisticated requirements, reliable measurement and inspection equipment is vital. A7 Intégration is a Quebec-based firm that manufactures a wide range of blades and vanes for the turbine engines of modern aircraft and energy generators. Since its formation in 2013, it has produced hundreds of thousands of blades and vanes. Since 2020, its equipment of choice for in-process quality assurance has been the optical 3D measuring machine ScanBox 4105 from ZEISS in combination with the ATOS Q scanner.



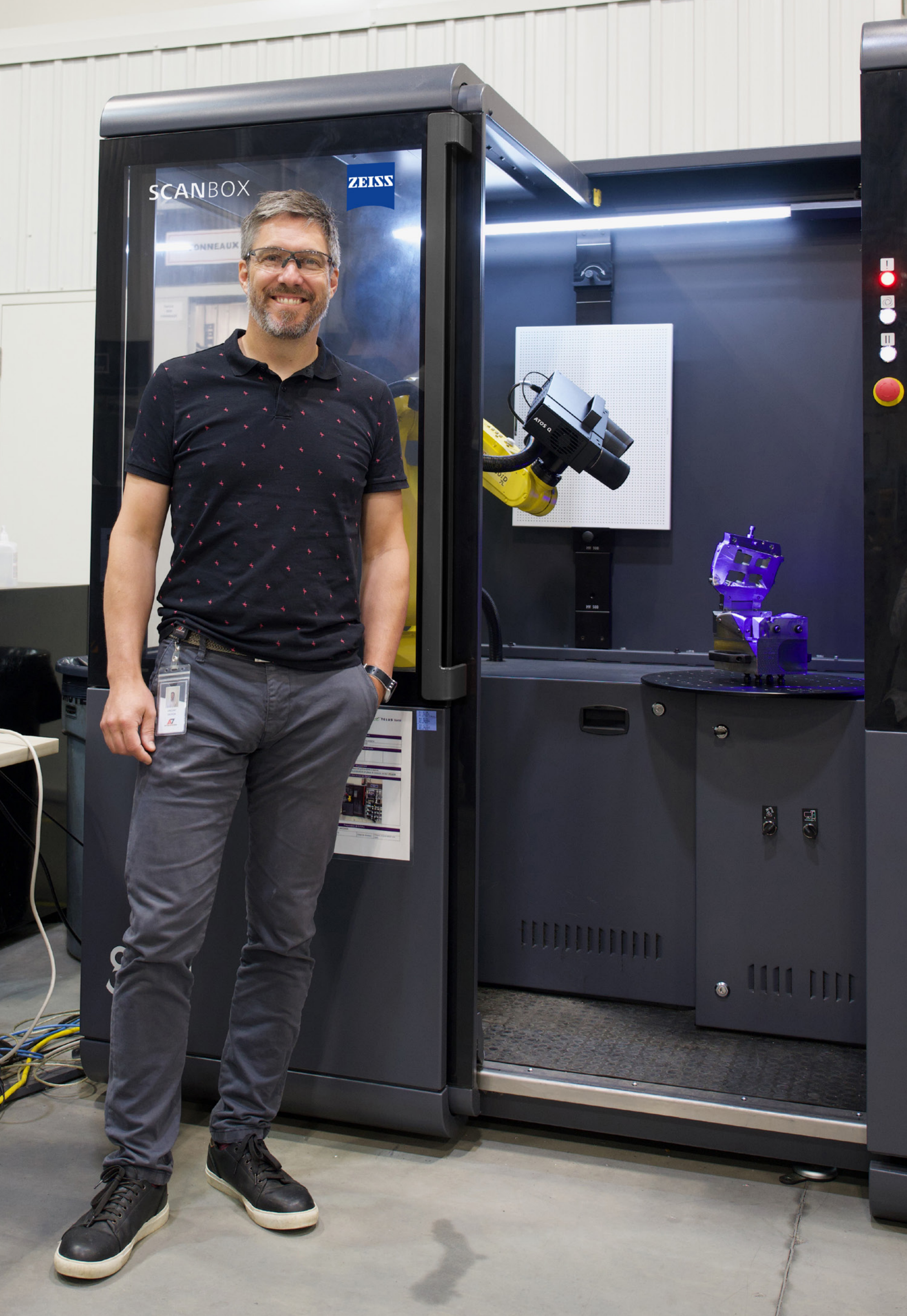


3D metrology for complex designs

The complex geometric surfaces and shapes of blades and vanes pose the biggest measurement challenge. This complexity is likely to intensify as more innovative designs are introduced that serve to reduce carbon dioxide emissions and improve engine performance. Scanning and inspection technology can master these challenges, which is why the ScanBox system is such an integral part of the production process at A7 Intégration.

ScanBox 4105 is an optical 3D measuring machine for parts of up to 500 mm in size that is equipped with a light, compact 3D scanner. Each high-speed scan (lasting less than a second) captures an object from three different angles in high resolution. Once the series of measurements has been completed, the integrated ZEISS INSPECT software combines these scans to a geometrical digital twin, or 3D model, of the part. At this point, differences between the actual 3D coordinates and the CAD data are immediately revealed.





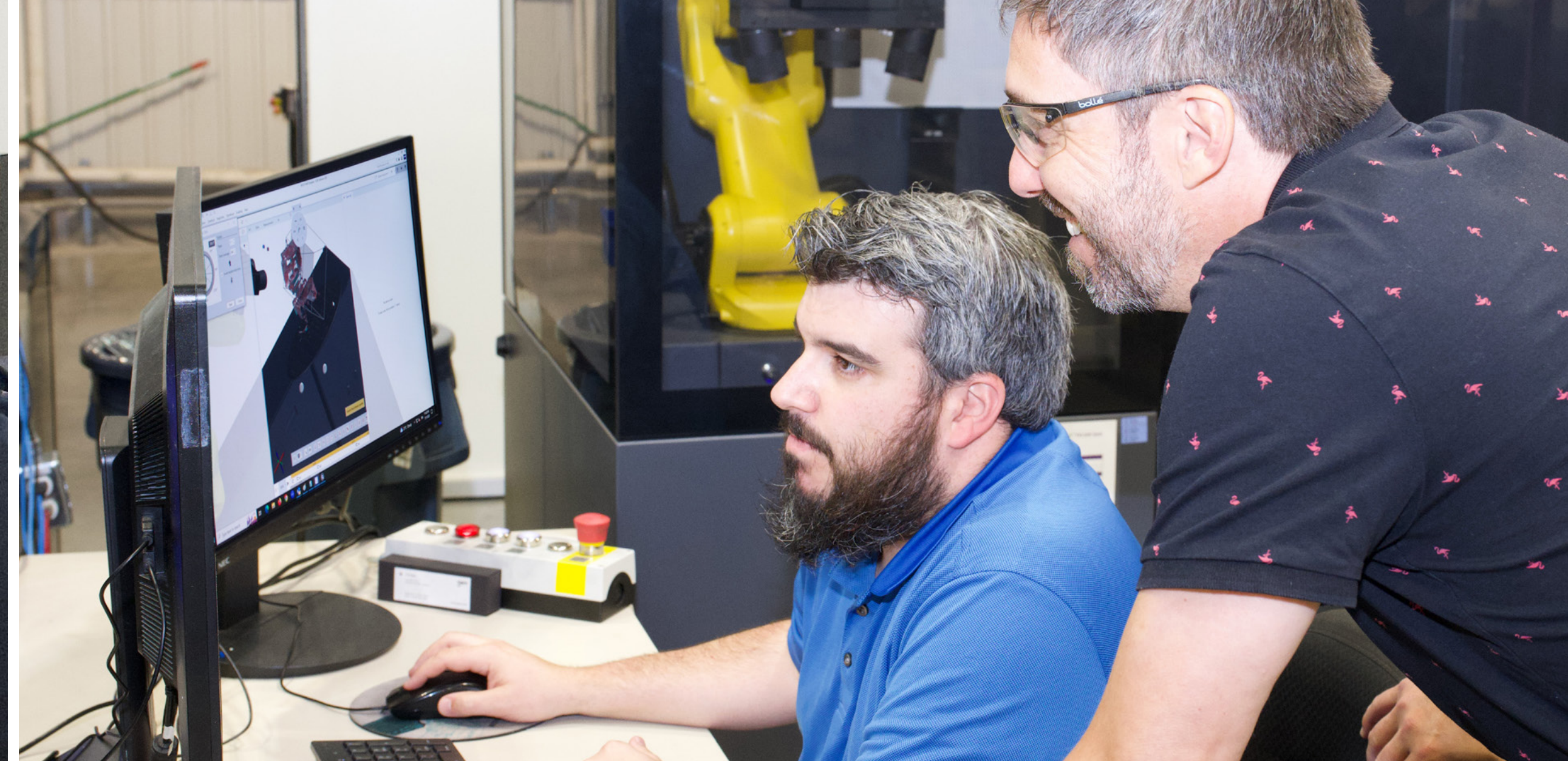
Fast troubleshooting

*"ScanBox helps us develop the machining recipe:
How to set up the machine and become more efficient
in producing precise parts."*

Vincent Vachon, head of business development at A7 Intégration

"It helps us troubleshoot and debug the part: If mistakes are found on a part during the production process, they can be immediately corrected by adapting the software program or fine-tuning the machine."

Measurements with ScanBox 4105 take just 4 minutes, as opposed to 45 minutes using conventional technology. "We get to a good part much faster than if we did not have this [technology]," says Vachon. "The ScanBox precision meets and exceeds the precision requirements."



User-friendly and seamless workflow

The ScanBox optical measuring machine is used by different employees both on the shop floor and in the quality-assurance department, and inspections are only one part of the job. Therefore, user-friendliness was a key reason for choosing the technology from ZEISS.

“It is very convenient for users to set up ScanBox and carry out their inspections,” continues Vachon. With its four wheels, the system can be easily moved to different locations, and you only need a normal power socket to start your measurement. “Programming the robot is very easy and the interface for doing the inspections is intuitive.”

One of the features that Vachon rates as being most user-friendly is the ability to integrate data from the ZEISS INSPECT Airfoil software into other software, such as ZEISS PiWeb (a reporting and statistics software). This enables users to quickly visualize, analyze, adjust and share their results.

By feeding data from ScanBox into the CMM report, a common requirement in the industry, A7 Intégration can demonstrate furthermore that the measuring data meet quality standards. “Hopefully, over time, the scanner report will become standard as well,” says Vachon.

Lower cost, higher output

A7 Intégration has experienced a dramatic boost in productivity since it began using ZEISS technology. These productivity gains have improved A7 Intégration's margins and enabled the company to offer its customers more competitive prices and faster lead times – a win-win for everyone.

The ZEISS technology not only helps A7 Intégration to master its measurement and inspection challenges, but it also creates new business opportunities for tomorrow.

For example, for larger parts and part families, A7 Intégration has until now hired – at considerable cost – an external laser-tracking firm to perform the measurements and inspections. As part of its vertical-integration strategy, A7 Intégration now plans to offer these services in-house by combining the ATOS Q sensor with the TRITOP optical photogrammetry system. This will help A7 Intégration to shorten its inspection cycles, thus creating additional efficiencies.

"We want to be technologically ahead of the curve, and having equipment like this sets us apart," says Vachon. "We are a medium-sized company, and ZEISS technology is a differentiator in our line of business for our size of company." The ScanBox system builds on an already successful technological relationship. As a long-time user, A7 Intégration has multiple CMMs – ZEISS DuraMax for shop-floor measurements and ZEISS ACCURA for the laboratory.

Outstanding support

"But there is so much more to the technology than just the product," emphasizes Vachon. "It is a human experience. The product is backed by nice and knowledgeable people who believe in their product and support it well. We have world-class service through Xpert 3D Metrology, our seller here in Canada. It is a very collaborative experience."





A7 Intégration, based in Granby, Quebec, was founded in 2013 by a group of individuals with long and deep experience in aerospace engineering. The company specializes in providing advanced engineering, high-precision machining and complex assemblies to the aerospace, transportation, energy and mining sectors. A7 Intégration has 125 employees.

