

COMPOSITE INSPECTION SYSTEM

A NEW APPROACH TO QUALITY CONTROL FOR CARBON-FIBRE PARTS





THE NEW FACE OF HIGH-SPEED CARBON-FIBRE ANALYSIS

The first ever system dedicated to carbon-fibre part applications, the Composite Inspection System from Hexagon Manufacturing Intelligence is set to revolutionise portable composite part inspection and analysis.

The system comprises the custom-built Apodius Explorer 3D software solution combined with HP-C-V3D Apodius Vision Sensor hardware that has been designed to combine perfectly with a ROMER Absolute Arm with Integrated Scanner.

With its advanced camera-based vision system and software designed specifically for composite component analysis, the Composite Inspection System delivers unmatched defect detection and full-part digitisation for carbon-fibre components.

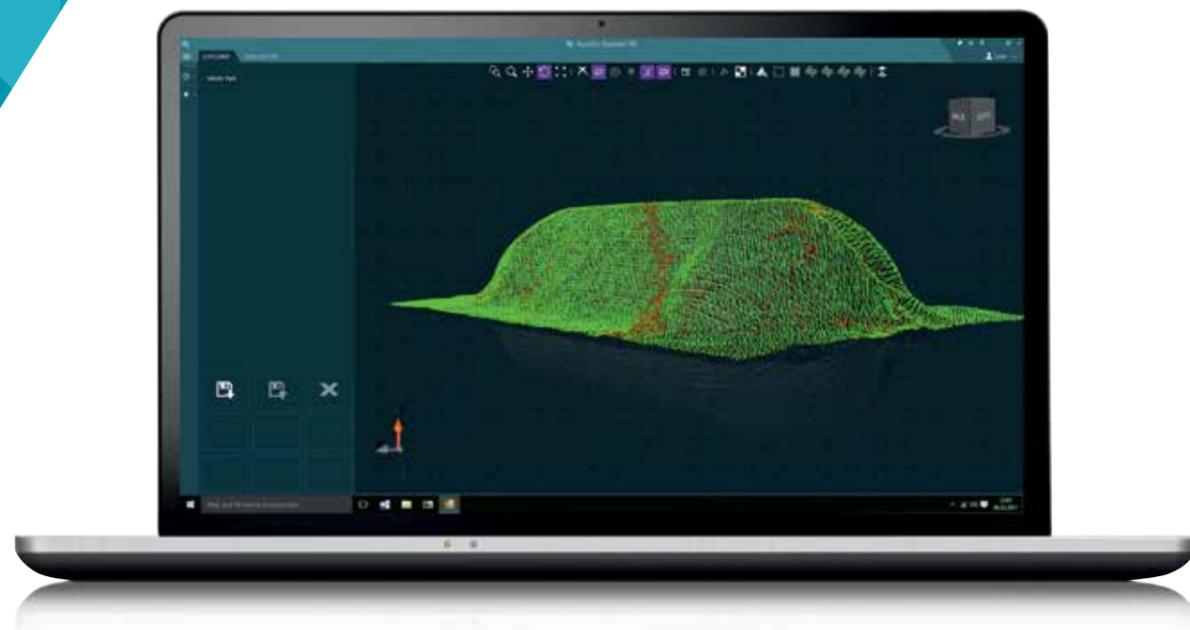
APODIUS EXPLORER 3D

DEDICATED SOFTWARE FOR PERFECT RESULTS

Apodius Explorer 3D is an innovative and intuitive real-time software solution designed specifically for handling the unique challenges of composite scanning.

The software combines instant image processing, measurement output handling and automatic report generation to make composite evaluation faster and easier than ever before. The entire measurement process is visualised in real time within the programme to ensure accurate measurement, while a variety of data output and export formats facilitate further analysis and documentation.

The capacity to output fully-digitised three-dimensional models based on real-world measurements is a key feature, allowing for actual-to-target value comparison through a variety of output modes, including colour-coded simultaneous model and measurement data display.



HP-C-V3D

APODIUS VISION SENSOR

WHOLE-PART DIGITALISATION

The three-dimensional scanning capabilities of the HP-C-V3D Apodius Vision Sensor allow for complete surface texture mapping and the automatic acquisition of full-part geometries for composite components and products.

By projecting the recorded local fibre angle and photo-capture of the actual surface texture onto recorded component geometries, the system delivers a three-dimensional fibre orientation measurement that can be compared with data from simulation or design. Deviations in geometry and fibre orientation can then be specified and previously difficult to define production errors such as folds, gaps, undulations and wrinkles can be documented and classified.

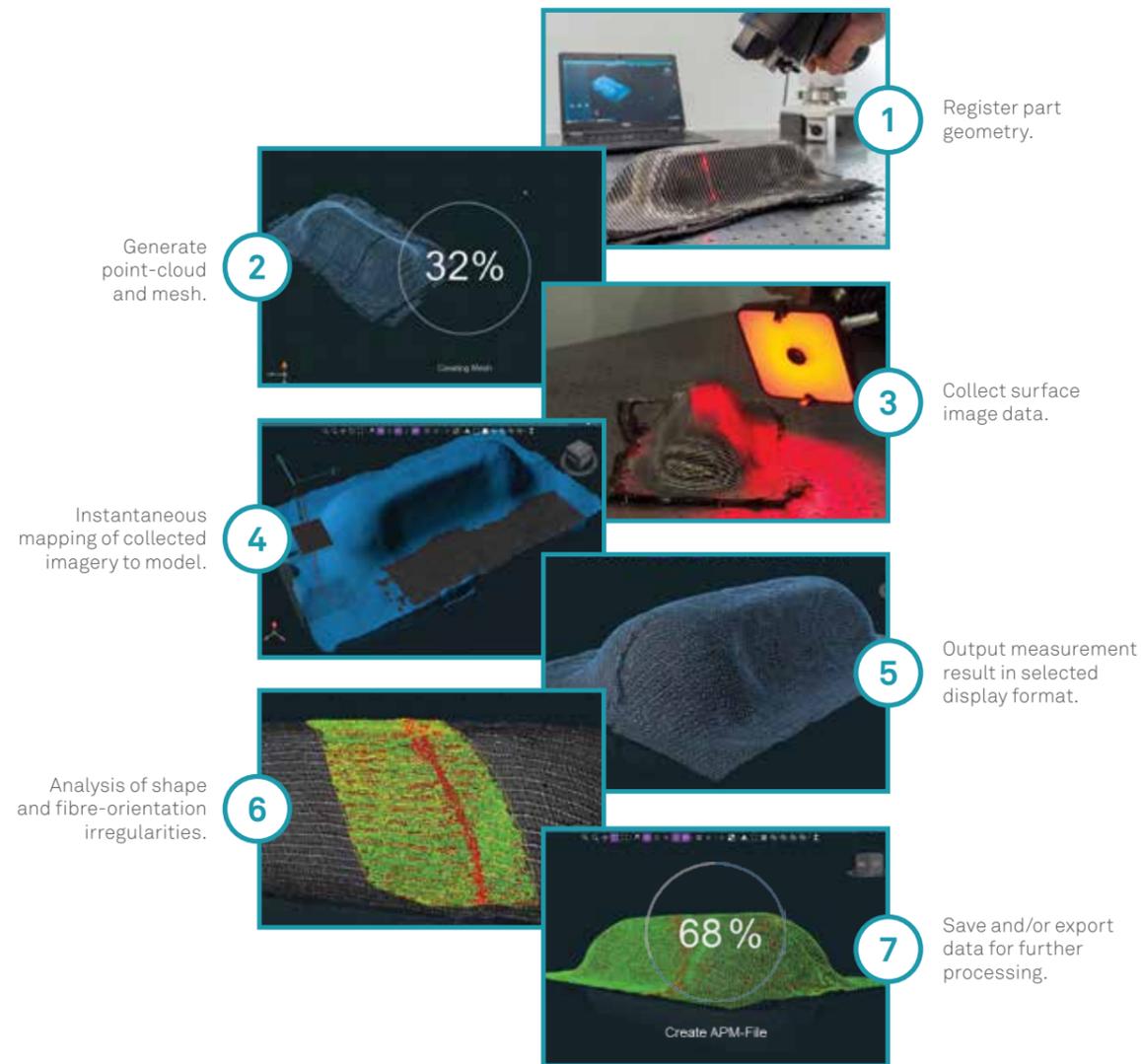
The ergonomic design of the scanner offers flexible use throughout the ultra-high-speed data acquisition process, drastically accelerating and simplifying the full verification process of high-precision carbon components.

HP-C-V3D Apodius Vision Sensor	
Laser protection class	1 (IEC 60825-1:2014)
Laser	Crosshair laser, visible red, 650 nm, 3.5 mW
Stand-off	110 mm approx. (4.3 in)
Field of view	Approx. 78 mm x 58 mm (3.07 in x 2.28 in)
Focal length	12 mm
Aperture	F/8
Resolution	2048 px x 1536 px
Flash rate (max.)	6/s
Size L x W x H	155 mm x 180 mm x 152 mm (6.1 in x 7.09 in x 5.98 in)
Weight	460 g

THE PROCESS

SIMPLE AND EFFICIENT COMPOSITE ANALYSIS

The Composite Inspection System makes measuring and analysing the quality of carbon-fibre components more straightforward and portable than ever before.



ROMER ABSOLUTE ARM WITH INTEGRATED SCANNER

PARTNER IN QUALITY MEASUREMENT

The unrivalled technological advances of the Composite Inspection System are a perfect match for the class-leading ROMER Absolute Arm with Integrated Scanner (SI).

The arm serves as a global reference system for the data collected by the HP-C-V3D Apodius Vision Sensor, becoming a vital component of the full-part digitisation and analysis process. With the total system certification that comes as standard with every ROMER Absolute Arm, confidence in the accuracy of captured data is guaranteed.



- ROMER Absolute Arm SI available in six sizes providing measurement volumes between 2.0 and 4.5 metres, as well as three accuracy levels in the 73 Series, 75 Series and 77 Series.
- High-tech carbon-fibre arm construction ensures strength and thermal stability under any environmental condition.
- Light and agile arm movement facilitated by design echoing the uneven arm ratio typical in industrial robots.
- Absolute Encoders within arm articulation joints eliminate referencing and warm-up times.
- HP-C-V3D Apodius Vision Sensor designed to fit perfectly at the tip of any SI model ROMER Absolute Arm.



Hexagon Manufacturing Intelligence helps industrial manufacturers develop the disruptive technologies of today and the life-changing products of tomorrow. As a leading metrology and manufacturing solution specialist, our expertise in sensing, thinking and acting – the collection, analysis and active use of measurement data – gives our customers the confidence to increase production speed and accelerate productivity while enhancing product quality.

Through a network of local service centres, production facilities and commercial operations across five continents, we are shaping smart change in manufacturing to build a world where quality drives productivity. For more information, visit HexagonMI.com.

Hexagon Manufacturing Intelligence is part of Hexagon (Nasdaq Stockholm: HEXA B; hexagon.com), a leading global provider of information technologies that drive quality and productivity across geospatial and industrial enterprise applications.

-  COORDINATE MEASURING MACHINES
-  3D LASER SCANNING
-  SENSORS
-  PORTABLE MEASURING ARMS
-  SERVICES
-  LASER TRACKERS & STATIONS
-  MULTISENSOR & OPTICAL SYSTEMS
-  WHITE LIGHT SCANNERS
-  METROLOGY SOFTWARE SOLUTIONS
-  CAD / CAM
-  STATISTICAL PROCESS CONTROL
-  AUTOMATED APPLICATIONS
-  MICROMETERS, CALIPERS AND GAUGES



Apodius is an emerging leader in lightweight carbon composite inspection and analysis. Combining progressive sensor and integration knowledge with advanced data processing and interpretation expertise, the company delivers leading quality assurance solutions to OEMs and suppliers across every industry in which composite component production is a key concern.

With a focus on realising and integrating measurement solutions for composite production that target both process and product characteristics, Apodius also develops innovative software packages for the analysis of measurement data and supports automation concepts requiring production-integrated quality control.

In the field of advanced composite production solutions, Apodius combines the professionalism of a measurement technology market leader with the young and dynamic work culture of a pioneer. For more information, visit apodius.de.