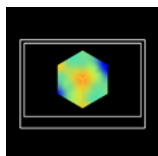


Application Note:

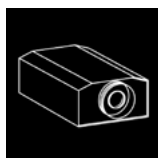
# GFRP automotive components

## Key parameters



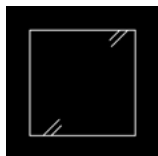
### Measurement method

Imaging-based



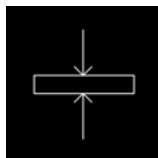
### Device

coatmaster 3D Atline



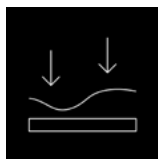
### Substrate

Carbon/Glass Fiber Reinforced Plastic



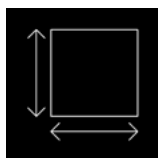
### Substrate thickness

Typically 2 mm to 5 mm



### Coating thickness range

30µm - 150µm



### Measuring area

Up to 2 m<sup>2</sup>

# Objective

This application note demonstrates the use of the coatmaster 3D Technology for the precise, non-destructive measurement of functional and aesthetic coatings on complex composite components, overcoming the inherent challenges of the substrate material.

# The challenge

While composites like CFRP and GFRP offer significant weight and strength advantages, their unique properties make coating quality control exceptionally difficult. Punctual measurement methods are practically excluded.

## Anisotropic substrate

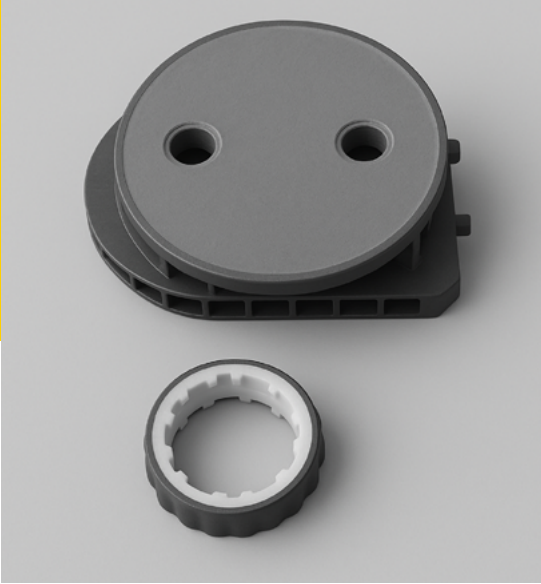
Unlike metals, the material properties of composites are direction-dependent due to the fiber orientation. This anisotropy, which leads to a direction-dependent speed of sound, makes conventional ultrasonic measurement methods unreliable.

## Complex geometry

Automotive composite parts often have complex aerodynamic shapes. Measuring coatings consistently across these free-form surfaces within the required tight tolerance windows is a significant challenge.

## Function-critical coatings

The coating on a composite part is often function-critical, providing essential UV protection for the underlying resin. Ensuring this protective layer meets thickness specifications is vital for the part's long-term durability and performance.



# The coatmaster solution

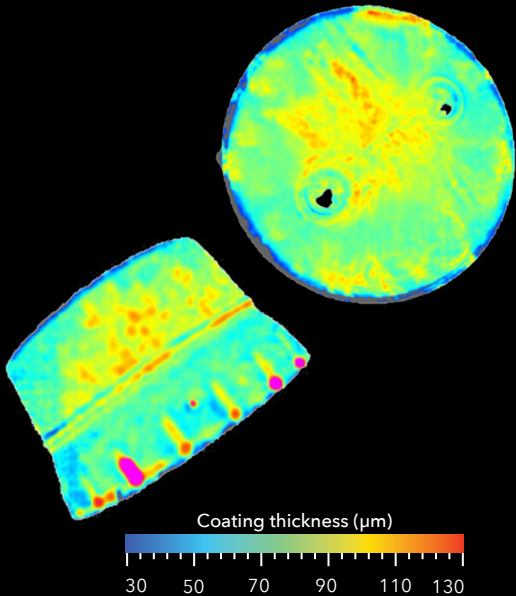
The coatmaster 3D measurement technology provides a comprehensive solution uniquely suited for composites. Its novel approach is insensitive to the anisotropic properties of the substrate, delivering accurate thickness values regardless of fiber orientation.

By capturing the entire surface of complex-shaped parts in a single process, coatmaster generates a complete, high-resolution thickness map. This allows manufacturers to verify that critical coating thickness specifications are met across 100% of the part, ensuring both aesthetic perfection and functional performance.

# Measurement setup

Parameter	Value
Measurement distance	
Energy	
Measurement area	

Reference device	
Measurement speed	500 ms
Repeatability	1-2%
Local resolution	< 0.1 mm
Tested measurement range	30-150 µm



# Conclusion

The coatmaster is the essential quality control tool for the growing use of advanced composites in the automotive industry. It provides a fast, reliable, and automatable measurement capability that overcomes the limitations of all other methods, enabling manufacturers to guarantee the quality and durability of their most innovative components.