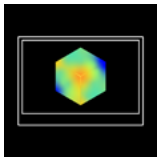
coatmaster

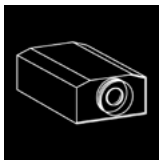
Application Note:

Car Windshields

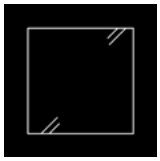
Key parameters



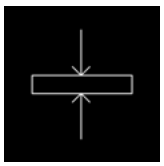
Measurement method
Imaging-based



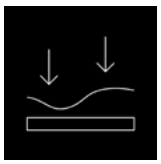
Device
coatmaster 3D Atline



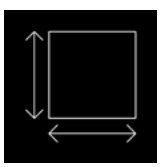
Substrate
Carbon/Glass Fiber Reinforced Plastic



Substrate thickness
Typically 2 mm to 5 mm



Coating thickness range
5µm - 40µm



Measuring area
Up to 2 m^2

Objective

This application note demonstrates the use of the coatmaster 3D Technology for automated, non-destructive measurement of safety-critical coatings on complex, curved automotive windshields, ensuring process reliability and product safety.

The challenge

Verifying coating thickness on automotive glass is essential for vehicle safety and performance, but it presents significant challenges.

Complex 3D geometry

Windshields possess compound curvatures that make measurement with contact probes or fixed-focus sensors impossible for 100% inspection.

Safety-critical adhesion

The primer or adhesion promoter applied to the windshield's edge is critical for the structural bonding of the glass to the vehicle frame.

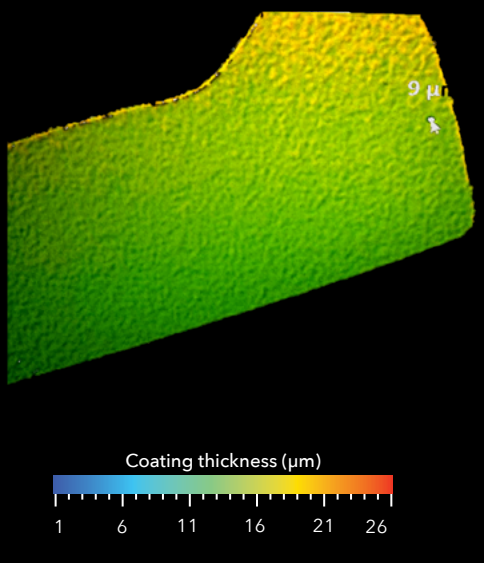
Multi-layer substrate

A windshield is a laminated structure of glass and a polymer interlayer (PVB). This complexity can interfere with traditional measurement methods, leading to inaccurate results.

The coatmaster solution

The coatmaster provides a reliable, non-contact solution that overcomes these specific challenges. By utilizing advanced imaging technology, it measures the absolute coating thickness in a single, rapid process, regardless of the coating's curing state.

By scanning the entire bonding area ("frit"), the system checks that the adhesion promoter is applied at the correct thickness everywhere. This guarantees a perfect bond, enhances vehicle safety, and eliminates the need for manual spot-checks, which are slow and provide incomplete data.



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	5-40 µm

Conclusion

The coatmaster 3D Technology is the essential tool for ensuring the quality and safety of coated automotive glass. Its ability to measure precisely on curved, multi-layered substrates provides automotive manufacturers with unparalleled process control, guaranteeing coating performance and the structural integrity of the final vehicle assembly.