

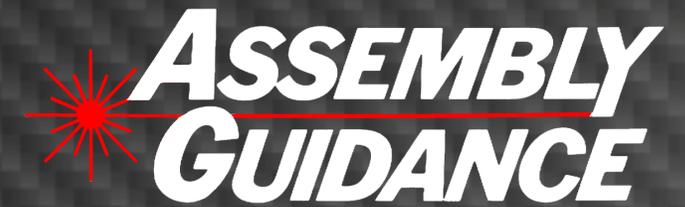
ASSEMBLY GUIDANCE



Advanced Laser Projection Process Control – Automatic Inspection

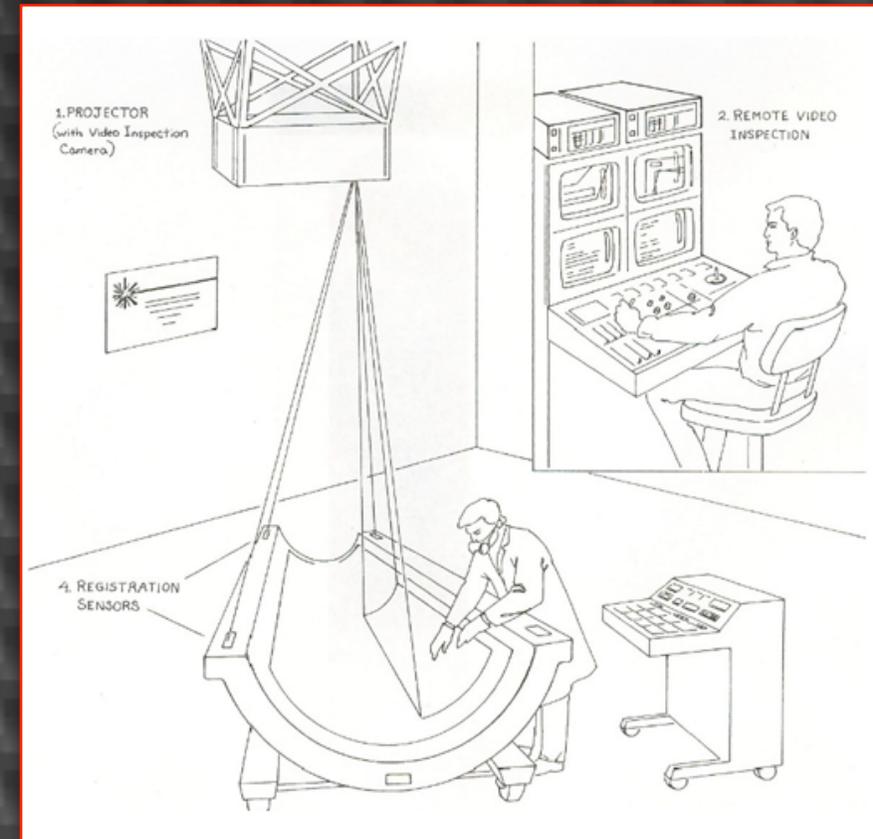
Scott Blake – 1 February 2017

About Assembly Guidance



1986: First Laser Projection and Inspection Concept

- Founded in 1988 near Boston, MA, USA
- Focused on:
 - Advanced Laser Projection
 - Aimed Vision
 - Process Control

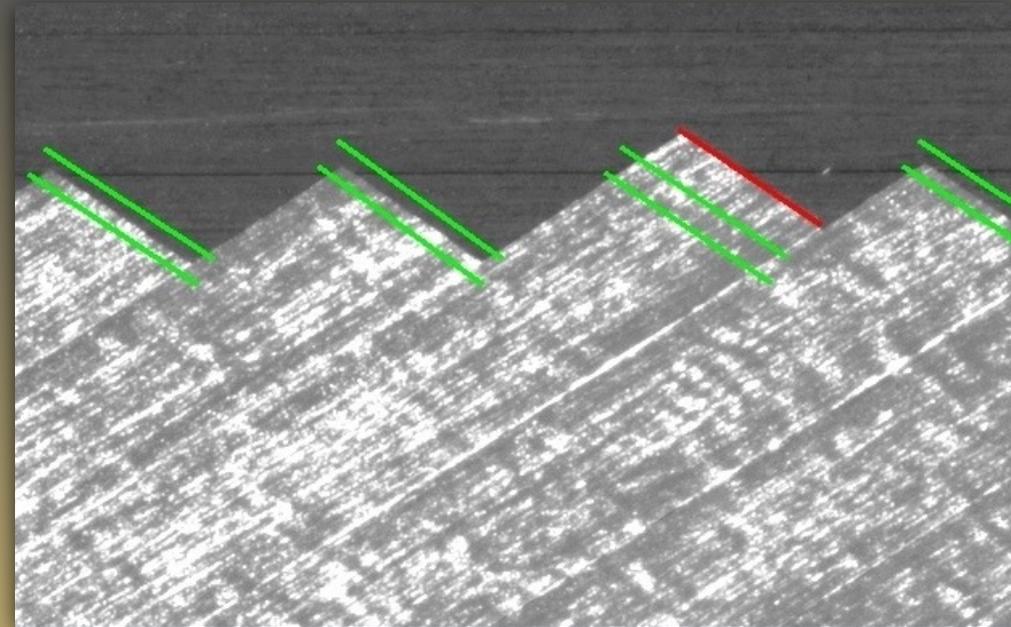


LASERVISION

- Combines LASERGUIDE projector with aimed, high-mag-and-res image capture system
- Automatic imaging of complex surfaces
- Small regions (12cm x 12cm) anywhere in a 3.5m x 3.5m envelope



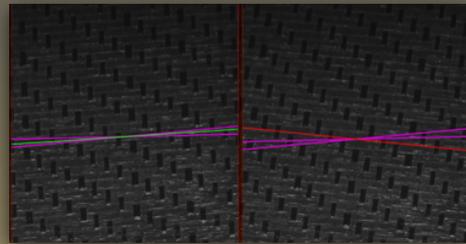
Automatic Inspection and Process Control



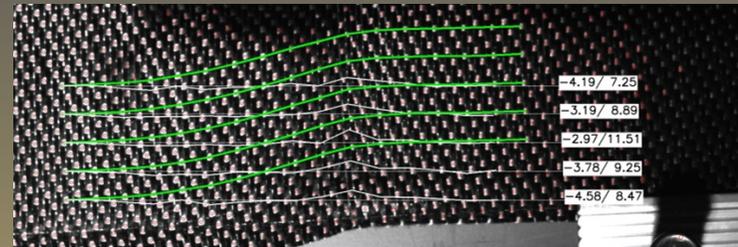
Automatic Verification and Documentation of Location and Characteristics of all tows in 777X wingskin and spar

Automatic Inspection and Process Control

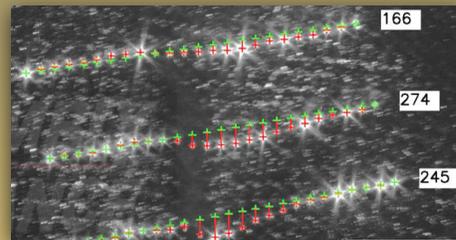
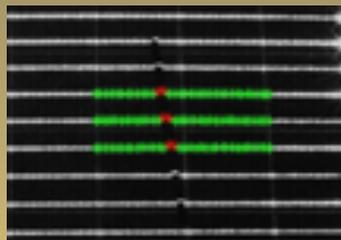
Images show analysis and archived documentation.
Images are not viewed during operation.



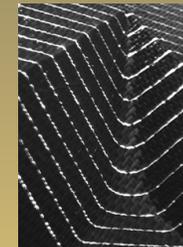
Fiber Orientation



Shear Measurement: Automatic tracing of tow paths and angular change at each appearance



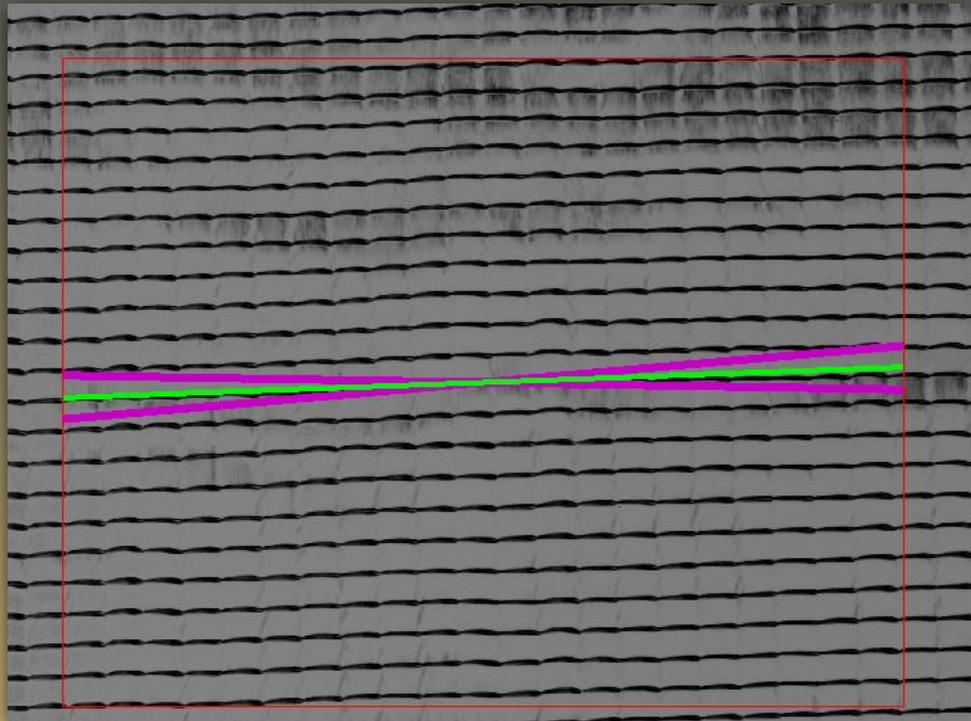
Wrinkles



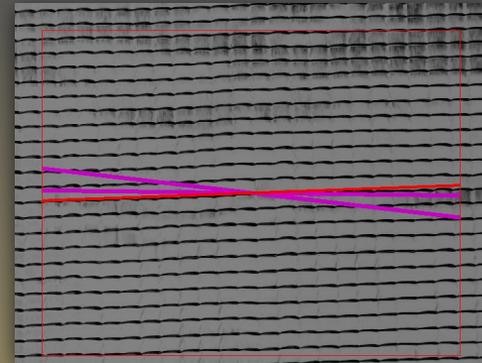
Bridging



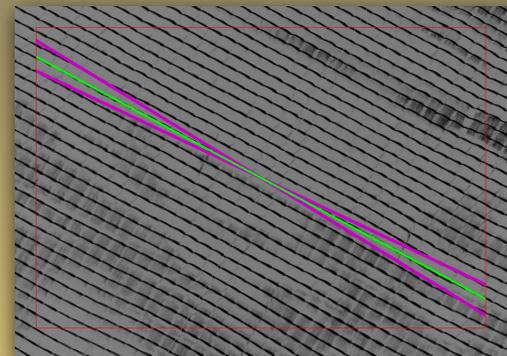
Automatic Fiber Orientation Measurement From Tracers



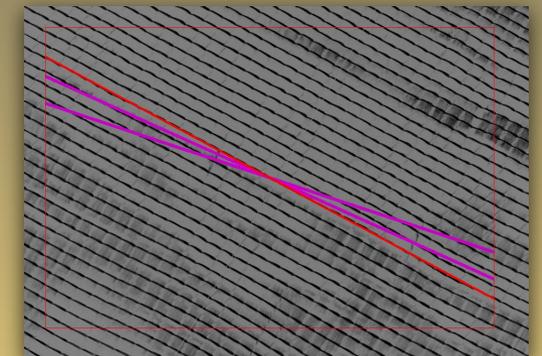
IN TOLERANCE



OUT OF TOLERANCE



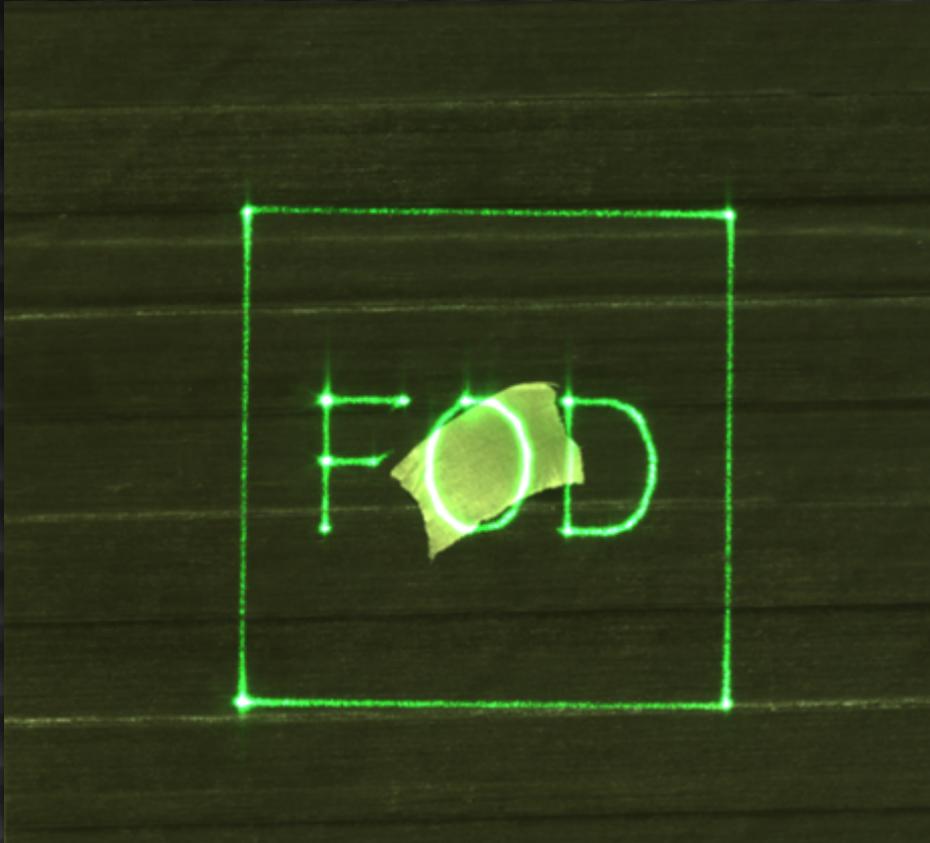
30 DEG IN TOLERANCE



30 DEG OUT OF TOLERANCE

- Automatically captured by LASERVISION
- 3m x 3m field

Automatic FOD Prevention and Pinpointing



ASSEMBLY GUIDANCE



***Advanced Laser Projection
Process Control
Automatic Inspection***



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