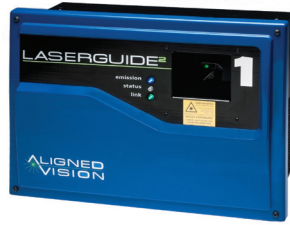
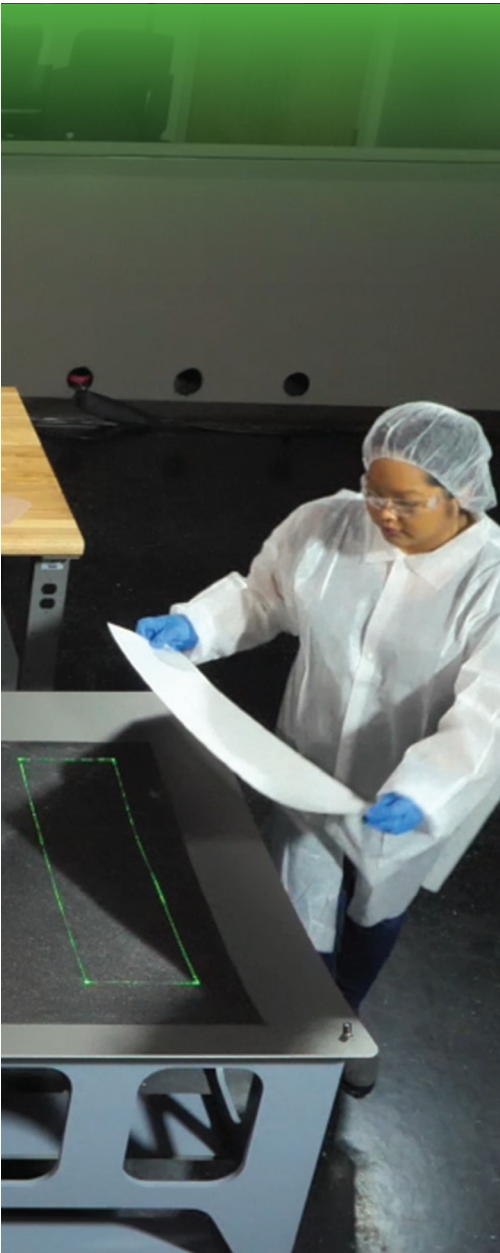


ALIGNED VISION

LASER PROJECTION
MOBILE PROCESS CONTROL
3D AUTOMATIC INSPECTION
AS-BUILT DIGITAL TWIN



LASERGUIDE²



microLASERGUIDE



LASERVISION



BUILDGUIDE

aligned-vision.com



**ENABLING
TECHNOLOGIES
FOR THE
MANUFACTURING
SHOP FLOOR**

*OUR LIGHT
BRINGS YOUR CAD
INTO THE REAL WORLD*



OUR CUSTOMERS ENJOY
LOWEST TOTAL COST OF OWNERSHIP
RAPID ROIs
ACCELERATED QUALITY MANUFACTURING
FULL SCALABILITY AND EXTENSIBILITY
INTO INDUSTRY 4.0 PLATFORMS



Leverage the power of your design and engineering data onto the manufacturing floor. Then generate vital as-built data to feed closed-loop, continuous improvements across your operations. Aligned Vision technologies join virtual and real production, helping you:

- Build components that match your designs
- Fabricate according to the processes your engineers plan
- Optimize manufacturing quality and speed
- Automatically generate accurate as-built data
- Feed deep learning systems for manufacturing insights and improvements

Aligned Vision systems operate as digital point solutions with immediate out-of-the-box standalone benefits, and as Industry 4.0 building blocks of tomorrow's digital factory.



LASERGUIDE²

LASER PROJECTION SYSTEM

3D industrial laser projection has never been as accurate, reliable and versatile as it is today with LASERGUIDE².

WITH ANY LASERGUIDE² SYSTEM, YOU WILL:

- Need fewer projectors, controllers and setup activities than with any other laser system
- Project up to 4 jobs per projector, keeping 4 teams adding value, with our multitasking feature
- Enjoy the safest, brightest laser – the first CDRH Class II/IEC Class 2 laser in the industry
- Keep operators working on fabrication – instead of projectors – with our industry-leading reliability

THE ONLY COMPANY WITH A PROJECTOR FOR EVERY APPLICATION

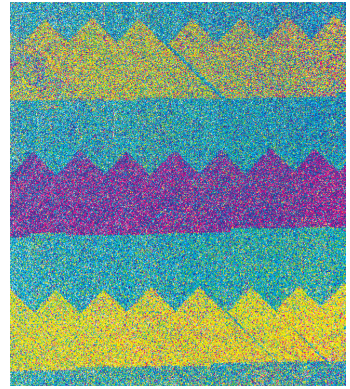
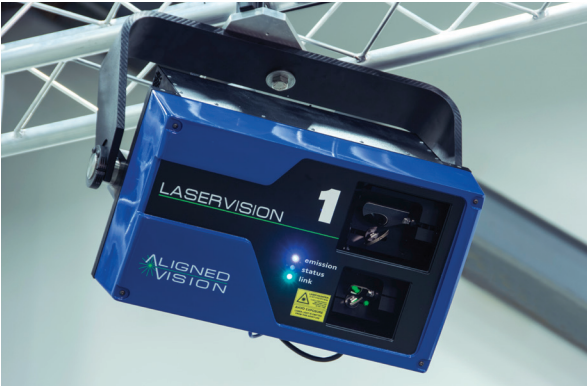
<u>microLASERGUIDE</u>	Only 8 lb in an 8½" x 4" x 5½" housing Greatest accuracy in an ultra-portable package Easy handling, mounting and relocating by a single operator
<u>LASERGUIDE²</u>	Industry's foremost standard system Best-in-class range and functionality Designed for projection range of 3 to 20 ft
<u>LASERGUIDE²</u> Long Throw (LT)	Same outstanding features as LASERGUIDE ² Designed for projection range of 3 to 40 ft
<u>LASERGUIDE²</u> Long Throw Extended (LTE)	Same outstanding features as LASERGUIDE ² Designed for projection range of 3 to 50 ft Proven Boeing-qualified projection at 50 ft every time

PROVEN PROGRAMS

START DATES

LASERGUIDE: Eurofighter Typhoon (1990), Boeing 777 (1990), Sikorsky Blackhawk (1991), Falcon 9 (2010)

MicroLASERGUIDE: F1 McLaren (2000), Renault (2002)



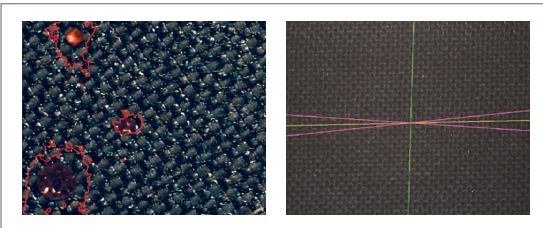
LASERVISION

3D PROJECTION AND AUTOMATIC INSPECTION SYSTEM

Integrating machine vision with proven industrial laser projection, LASERVISION brings large-field 3D automatic inspection to your shop floor.

BOOSTING QUALITY AND SPEED, LASERVISION:

- **Minimizes idle time** – automatically performs an inspection when the electronic work instructions call for it
- **Eliminates inspector wait time** – conducts inspections in seconds with no operator intervention
- **Optimizes inspection quality** – uses machine vision, eliminating human distraction, fatigue and verification bias

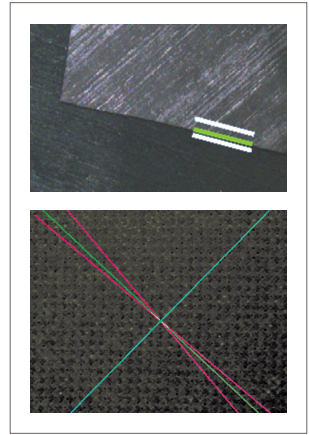
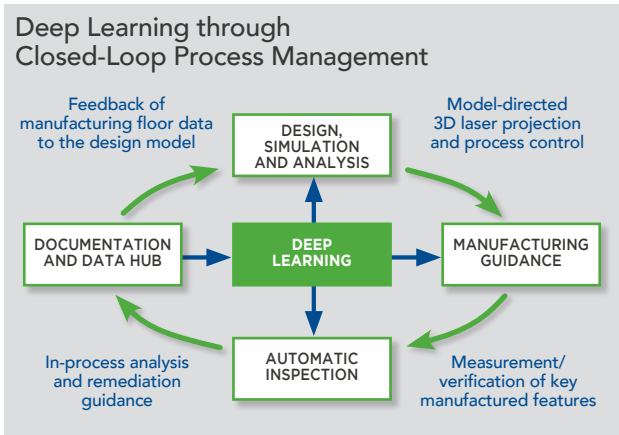


- **Markedly reduces rework and scrap** – verifies attributes in real time and flags FOD, misaligned materials, missing fasteners or other flaws for immediate correction
- **Automatically populates electronic documentation and generates the as-built digital twin, including**
 - Calibrated images of every inspected surface
 - Any nonconformances
 - Any corrective actions
- **Feeds deep learning and closed-loop process improvements**
 - Quantifies uncertainty
 - Enables tighter allowables and less overdesign

**PROVEN
PROGRAMS**

START DATES

LASERVISION: Boeing 777-X (2017),
Sikorsky Blackhawk (2019)



AS – BUILT DIGITAL TWIN

With Industry 4.0 on the near horizon – or already here – for many manufacturers, Aligned Vision products stand at the ready. The manufacturing intelligence generated by our BUILDGUIDE, LASERVISION and other systems – both images and data – automatically populates the as-built digital twin, a virtual representation of each individual component's specific attributes.

WITH THE AS-BUILT DIGITAL TWIN, YOU WILL:

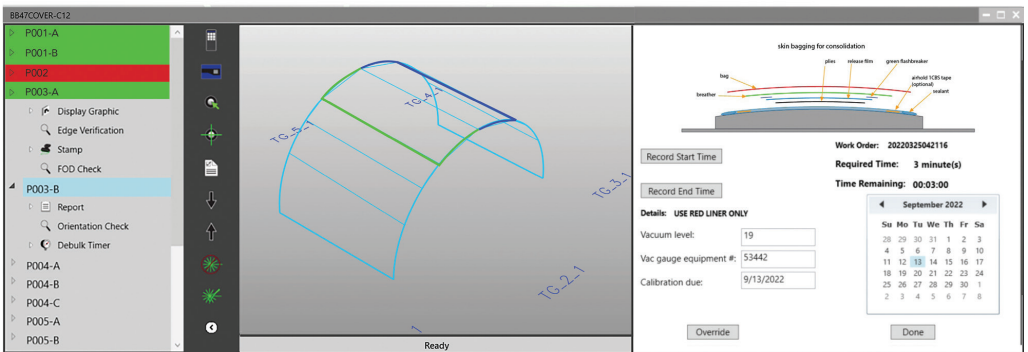
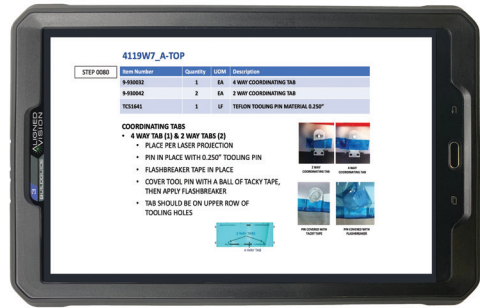
- Aggregate and contextualize component-specific data, including:
 - Material lot, out-time and other critical attributes
 - Team members involved in the build, and their roles
 - Duration of each manufacturing task
 - Debulk times and vacuum levels
 - Nonconformances and corrective actions
- Capture and save calibrated images from every automatic inspection
- Automatically combine calibrated images into a single image of each manufactured surface
- Enable direct comparison of as-designed and as-built digital twins
- Feed manufacturing intelligence to deep learning systems that generate closed-loop manufacturing improvements
- Quantify uncertainty, enabling tighter allowables and less overdesign

ALIGN 4.0 CONTROL SOFTWARE SOLUTION

ALIGN 4.0 is an open-platform system that helps accelerate operator value-added tasks and enables Industry 4.0 connectivity for 3D laser projection and automatic inspection processes. Only one control computer is needed to run up to 8 jobs simultaneously, minimizing equipment and maintenance costs as well as shop floor footprint, and making file management easy.

WITH ALIGN 4.0, YOU WILL:

- Provide operators with a familiar user experience, including 3D CAD images and 3D ply viewer window
- Support full control of each fabrication job both at the controller and on smart mobile devices
- Automatically orient mobile display screens to match the operator's view of the tool
- Improve Industry 4.0 connectivity with:
 - Support of master csv
 - Multiple file formats
 - Full integration both upstream and downstream of projection/inspection operations
 - Plug-and-play PLC interface
- Support **SystemAlign** registration, which automatically registers all projectors when the first is registered



PROVEN PROGRAMS
START DATES

Multitasking Software: F-22 (1995); C-17 (1998)



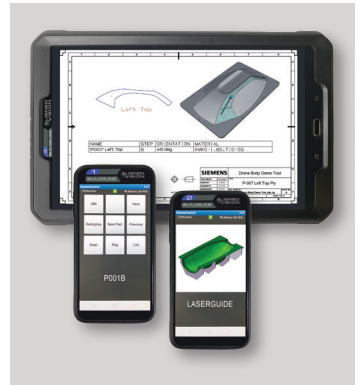
BUILDGUIDE

PROCESS CONTROL SUITE

Put your product work instructions literally in the palm of your operator's hand. BUILDGUIDE process control suite provides step-by-step guidance to your operator electronically via familiar mobile devices – smartphone or tablet.

OPTIMIZING YOUR MANUFACTURING QUALITY AND THROUGHPUT, BUILDGUIDE:

- Ensures that parts are built as designed
 - Complete graphic work instructions and ply book pages on each operator's mobile device
 - Non-layup steps included in instructions
 - Debulk management on device ensures correct sequence, vacuum pressure and duration
- Tracks all work steps and build progress electronically, including:
 - User logins, work orders, part selection and ply confirmation
 - Electronic buyoffs from each operator and inspector
- Generates a complete electronic report of each build, including:
 - Process parameters (e.g. debulk vacuum and duration)
 - Process sequence/timing
 - Buyoffs



PROVEN
PROGRAMS

START DATES

BUILDGUIDE: F-35 (2015), GE (2015), Janicki (2017)



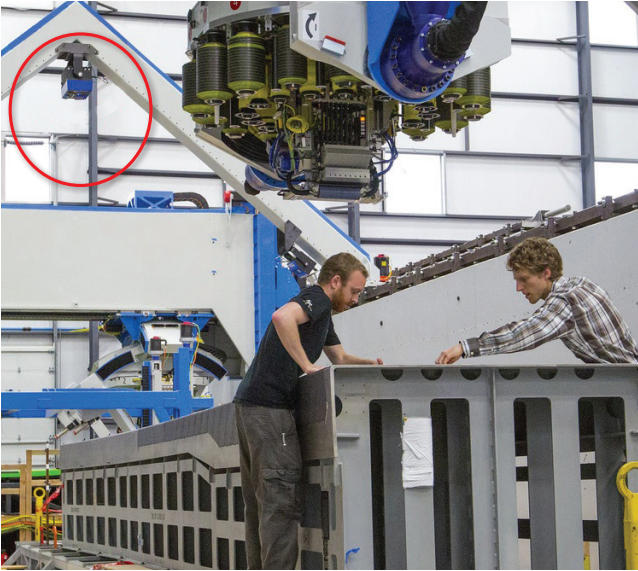
SMART MOBILE DEVICES

Keep your team at the tool, adding value. Familiar smart mobile devices replace paper work instructions and travelers with electronic work instructions and travelers with electronic buyoffs – all at the tool.

A SMART MOBILE DEVICE IN EACH OPERATOR'S HAND:

- Provides full control of the fabrication steps
 - Full support of electronic ply books with color graphics
 - Operator advances through steps via “Next” button on device
 - “Next” button automatically initiates LASERVISION inspections (when called for in the electronic work instructions)
- Replaces tedious interaction with control computer
 - Support of multiple jobs and up to 8 mobile devices on a single computer
 - Step-away time from tool eliminated
 - Real cycle time reductions generated

SDK SOFTWARE DEVELOPMENT KIT



Aligned Vision systems are ready for digitalization and automation of the shop floor. Our SDK is proven on production floors to enable integration with automated fiber placement (AFP), automated tape laying (ATL) and other automated manufacturing systems.

SDK INCLUDES:

- Automatic maintenance of common coordinate system
- Complete SDK: API, DLL, manual, sample code
- Instant display of any tow, course, boundary, lap or gap

PROVEN PROGRAMS

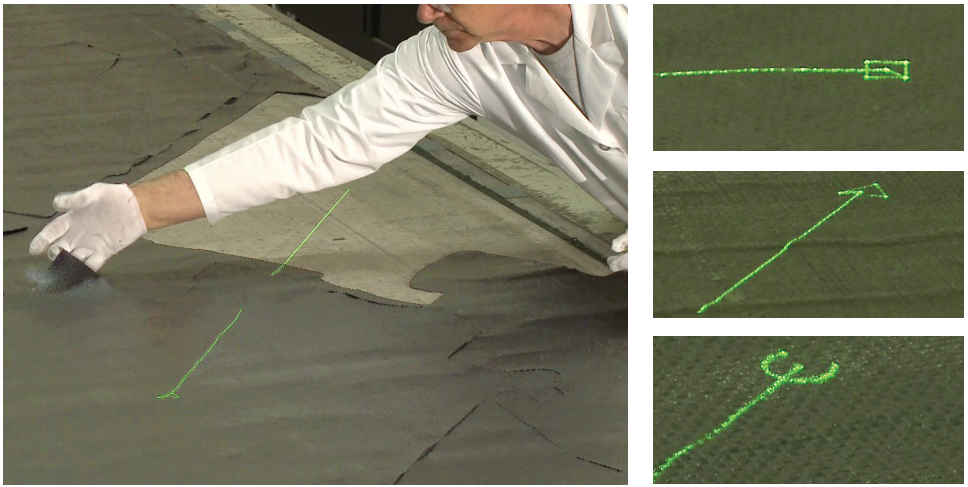
START DATES

SDK: 787 (2012), 777-X (2017)

AUXILIARY COMPONENTS

- Targets: Repairable, NIST traceable certification
- Stands: Portable, stock, custom
- Wireless label printers
- Barcode readers
- LED matrix billboards
- Certification tools





KITGUIDE

NEST SORTING

KITGUIDE uses accurate laser pinpointing to identify the next ply to be unloaded from a cutting table during kitting procedures.

INCREASING KITTING EFFICIENCY, KITGUIDE:

- Speeds sorting and eliminates kitting errors
 - Eliminates ply maps and label-based sorting
 - Supports simultaneous unloading from both sides of table
- Simultaneously guides unloading for up to 4 kits
- Generates barcode labels with optional wireless printers
- Supports up to 4 mobile devices and 4 printers
- Compatible with all nesting and cutter software



EXPERIENCE SUPERIOR CUSTOMER SERVICE



- Immediate technical support
- Unlimited free phone/email support
- Artificial Intelligence-enabled rapid application development
- Quick service turnaround: 2-3 days
- Lowest cost cal/cert and overhaul
- Loaner units provided during servicing
- Field-replaceable laser and galvos
- 2-year warranty



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