SOLUTION SHEET

DANTEC DYNAMICS

FlawHunter NDT System

Laser Shearography NDT System for fast & reliable inspection of large, sandwich, honeycomb, composite laminate, and bonded components

FlawHunter Laser Shearography NDT System

FlawHunter being used on a CFRP Laminate/Sandwich Component indicating localized impact damage and voids.

Portable NDT Solution for in-field (service) NDT and quality control (post-production) operations

The FlawHunter is an integrated NDT inspection device, equipped with an advanced, high-resolution Laser Shearography sensor with a vacuum (partial) excitation system. Designed as a completely compact, stand-alone system, the FlawHunter can be used by one NDT technician or operator.
It is ergonomic & easy-to-use and is equipped with a workflow-oriented, GUI-display and left/right-hand button control. The FlawHunter can be used on any material & surface provided a stable vacuum can be generated within the vacuum seal (viewable inspection area).

Key benefits

- Light & convenient system weighing only 9 kgs (20 lbs)
- Ergonomic & easy to handle with two (left- & right-hand), +/- 45° adjustable tilt handles
- Can inspect 320 mm x 230 mm (12.6 “ x 9 “) within a maximum of 10 seconds
- Safe to use system with laser safety Class 1.
- Fully integrated control electronics with no external connections
- Single-/Multi-Step measurement acquisition workflow via the trigger button operation
- Uses the 4+4 Phase Shifting technique removing measurement noise.
- Multiple vacuum frame seals available

NOVA INSTRUMENTS

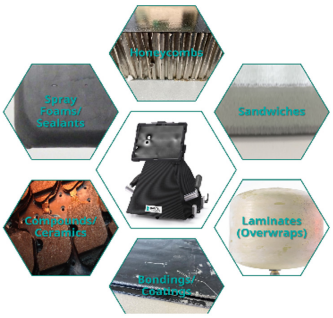
Sub-micrometer, measurement resolution

Laser Shearography is an optical, Non-Destructive Testing (NDT) technique used to reveal sub-surface defects in structures. This technique works through the application of a load to a structure for which a laser shearography sensor observes (minimal) surface bending in the form of an out-of-plane strain field, and subsequently images the measurement as a phase map.

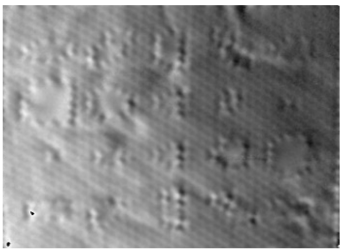
Since the sensor is sensitive to changes in the interference of laser light, the capability of the sensor to detect bending is within the sub-micrometer range. The ultimate goal of any NDT system is to deliver reliable measurement results as economically as possible. Laser Shearography is a perfect solution that can detect defects that other NDT methods cannot, including disbonds, kissing bonds, node bond splits, and ply wrinkling. In many cases the reliability of the technique, as quantified through the smallest detectable defect size at 90% Probability of Detection (PoD) and low False Call Rates is unmatched.

The economic advantages of using Laser Shearography include high inspection rates (i.e. m^2/sec), low sample preparation times, and formal NDT technique approval & recognition.

The best applications suited for the FlawHunter are large-bodied components made from honeycomb, sandwich, composite laminate, or bonded/coating (cross-section) constructions.



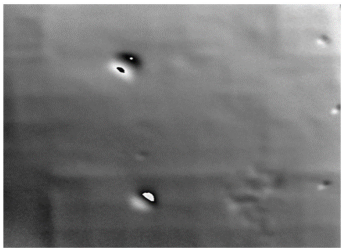
Applicable NDT Applications for Laser Shearography



Phase Map of an Alu. Honeycomb Comp using the FlawHunter. (Marine NDT)

FlawHunter being used on a CFRP Laminate/Sandwich Component.

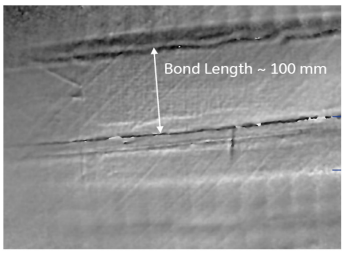
FlawHunter being used on an Aluminium Sandwich Component.



Phase Map of a Sandwich Comp using the FlawHunter. (Marine NDT)

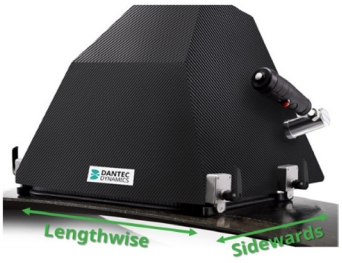
A workhorse for efficient & fast NDT inspection

The FlawHunter can inspect 320 mm x 230 mm (12.6 " x 9 ") within a maximum of 10 seconds (including; placement, clamping & measurement), yielding an inspection rate of 0.44 m^2/min (4.7 ft^2/min)! The vacuum pump typically requires 3-5 seconds to reach a steady vacuum level. Using the 4+4 Phase Shifting technique in conjunction with stable vacuum control via the integrated vacuum pump & controller, users can set the vacuum (pressure) level down to -11 kPa with a tolerance of +/- 0.05 kPa. The result yields measurement images with the best definition and clarity with minimal noise.

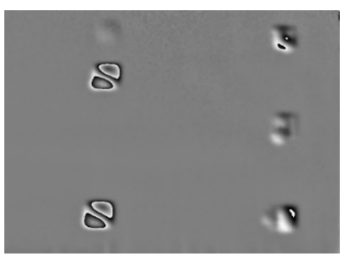


Phase Map of the Bondline Length of a TE Section using the FlawHunter. (Wind Power NDT)

View of FlawHunter from underneath, showing a sealed area (Field-of-View) and two laser diodes.



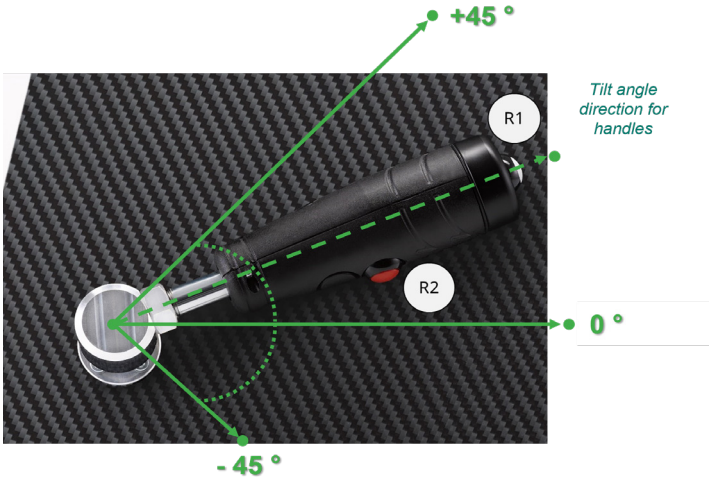
FlawHunter being used on a CFRP Laminate Component.



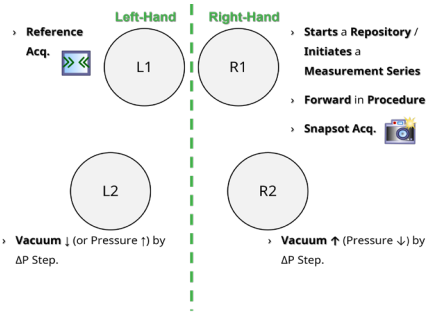
Phase Map of an Alu. Honeycomb Comp. using the FlawHunter. (Aerospace NDT)

Easy operation via workflow-oriented trigger buttons

The FlawHunter is equipped with two buttons on either handle (left & right). A grey trigger button (L1/R1) is operated using the thumb and the (L2/R2) trigger button is operated using the 3rd (middle) finger. With two (left- & right-hand), +/- 45° adjustable tilt handles and a ball-socket Tablet PC connection, the FlawHunter can be easily handled by operators to inspect any (accessibly difficult) surface.



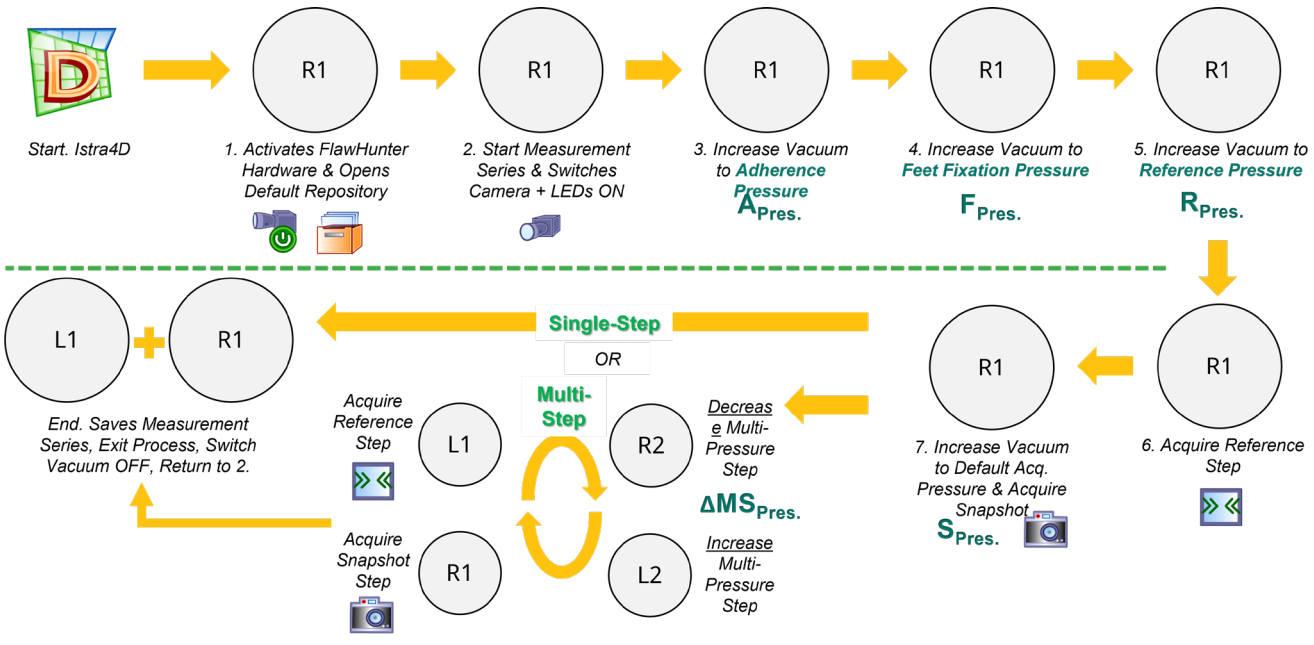
Tilt angle direction for handles



Left/Right-Hand button controls

Using the FlawHunter Laser Shearography NDT System users can perform two types of measurement modes: single-/multi-step measurement mode (standard) and manual measurement mode.
The single/multi-step GUI acquisition mode, as known from the Q-810, is combined in one mode in the FlawHunter. Users can use pre-selected pressure steps and take reference & snapshot measurements.

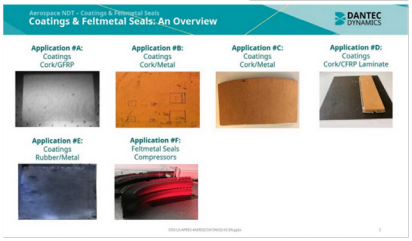
FlawHunter Laser Shearography NDT System



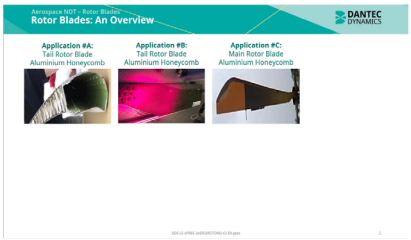
Single/multi-step GUI acquisition mode workflow

NDT applications

Aerospace NDT Webinar: Coatings & Feltmetal Seals – Video



Aerospace NDT Webinar: Rotor Blades – Video

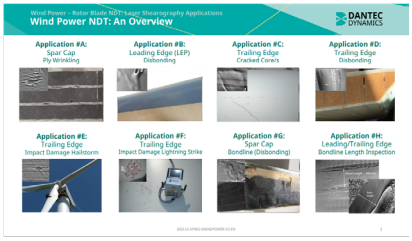


Aerospace NDT Webinar: Nacelles, Cowlings, Fairings & Radomes – Video

Aerospace NDT Webinar: Control Surfaces & Satellite Solar Arrays – Video

Marine NDT Webinar: Hulls & Rudders - Video

Wind Power NDT Webinar: Rotor Blades – Video



Customer Service & Support Benefits

Istra4D 4.9

1-year free software updates with technical support (E-mail/phone)

Unlimited access for an unlimited amount of users to the LS user training module via the Dantec eLearning platform.

1-year Warranty

1-year warranty (standard)

Access to a yearly servicing package at a fixed price, including Istra4D software upgrades

Online help/support using Teamviewer™ for application assistance and running troubleshooting diagnostics online (if needed).

TESTIA AN AIRBUS COMPANY

Dantec Dynamics works closely with accredited NDT training and servicing providers for Laser Sheargraphy NDT. Our primary training partner, Testia®, an Airbus® company, offers LS training to EN 4179 at Bristol in the UK. Certification can also be completed on location.

Technical specifications

Specifications	
Dimensions	380 mm x 430 mm x 400-500 mm* (15” x 17” x 15.7’-19.7”’*)
Weight	9 kg (20 lbs)
Field-of-View (FoV)	32 cm x 23 cm (12.6” x 9”)
Inspection Rate	0.44 m^2 /min** (4.7 ft^2/min**)
Camera	3.2 MPx / 37 Hz (standard) or 5 MPx / 24 Hz (optional) 12-bit CMOS camera
Shearing Sensor	SW-controllable shearing piezo (shear angle and shear distance) Phase-stepping piezo
Laser Unit	2 laser diodes 120mW (CW) @ 660nm
Laser class	Class 1 DIN EN 60825-1:2007 IEC 60825-1:2007 ANSI Z136.1-2014
Tablet PC	Display (13 “) / 3:2 / 2880 x 1920 Intel® Core™ i7 RAM: 16 GB SSD: 512 GB

(*) Depending on Tablet PC Angle
(**) Assuming max. 10 seconds for placement, clamping & measurement

Order information

Category	Item	Item no
FlawHunter	FlawHunter Laser Shearography NDT System - Tablet PC + Stylus	DSM 83000
Vacuum Frame Seals Curved Seal (Side R = 110 cm) (Exchangeable) Curved Seal (Side R = 115 cm) (Exchangeable)		 DSM 84010 DSM 84020
Docking Station	FlawHunter Office Docking System	DSM 83050

DANTEC DYNAMICS Turn Measurements into Knowledge

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NOVA INSTRUMENTS