

# Q-810

## Portable Shearography NDT System for Field Use

### Applications

- In-field use of large area NDT inspections delaminations, disbonds, kissing bonds, wrinkling, impact damage, crushed core and many more.
- Defect detection in composite materials carbon fiber, glass fiber, laminates, honeycomb etc.
- Inspect structural integrity, separation of structural components and bond lines.

### Features

- Rapid full-field inspection rate 300 mm x 200 mm every 10 seconds.
- Adaptive seals for usage on highly curved surfaces.
- Operates independent of the local environmental conditions and can be used for production or in-field inspections



*Fully integrated Q-810 Pro-line inspection system for production and in-field inspection of large surface areas*

### Introduction

The portable **Q-810 Laser Shearography Systems** are fully integrated NDT systems using laser shearography. The systems are suitable for defect detection in composite materials over large surface areas, in tough field environments.

### State of the art NDT Performance

The Q-810 Systems can detect defects such as delaminations, disbonds, kissing bonds, wrinkling, impact damage, crushed core and many more with no surface preparation. and bond lines. The turn-key optical systems are **non-contact** and **full-field** and will work on

such materials as carbon-fiber, glass-fiber, laminates, honeycomb, foam, metal and Glare.

### Large Surface Area Coverage

The integrated systems are optimised for large surface area inspections, for example on aircraft fuselages, wings, control surfaces, ship hulls, wind turbine blades and rocket components. The full-field inspection rate is a rapid **300 mm x 200 mm every 10 seconds**. With adaptive seals the systems can be used on flat as well as highly curved surfaces. The systems operate independently of the local environmental conditions and can be used for production or in-field inspections.

### Measurement Principle

The highly sensitive interferometric technique will measure microscopic surface deformations caused by internal flaws when a small loading is applied to the object. This can be done using thermal, pressure, vibration or mechanical excitation.

The results are displayed live as the material responds to the excitation and are easily interpreted by the operator. Further image processing is also available for export and reporting.

### Fully Integrated system

The Q-810 Systems consist of a vacuum hood with integrated shear optics and a laser diode illumination array which are both **hermetically sealed** to protect against dust and debris. The hood has an interchangeable flexible seal adapter and adjustable feet to provide a solid contact to the test object and tight pressure seal. The vacuum hood of the Q-810 provides lock-on and pressure excitation down to 150mbar and an optional heat source can be fitted to provide additional heat excitation.

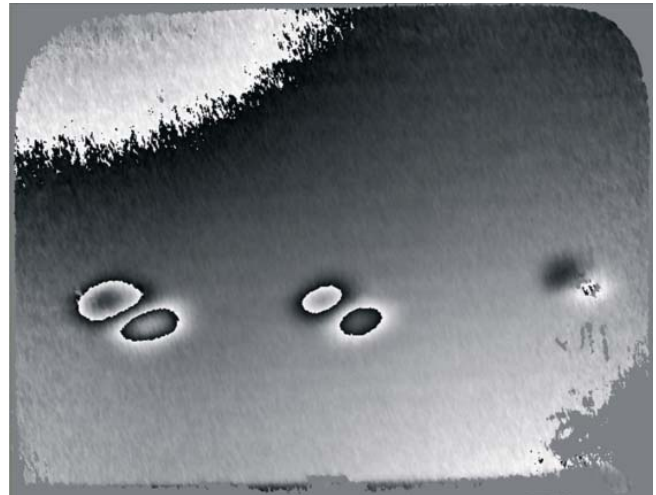
The vacuum hood is connected to a base unit by means of a *standard length* 10 m umbilical cable. The base unit houses the PC, control electronics and vacuum pump with a large monitor and keyboard. The complete system is controlled by the latest ISTRA 4D software platform.



### Very user-friendly operation

The complete system can be operated remotely using **two buttons** integrated into the handles of the vacuum hood. A **touch-screen monitor** can be fitted to the vacuum hood providing complete system control and allowing easy single operator usage.

The design of the hood and seal allows inspection very close to the edges of the component (< 15 mm). While the standard seal adapters already cover a large range of applications, (radii +/- 850 mm) special interchangeable adapters can be provided for specific geometries, such as small radii or corners.



*Defects in a composite panel*

### A Certified Technique

Shearography has been incorporated in ASNT standards since 2006. (SNT-TC1-A, and CP-105). ASTM standard (ASTM E2581) defines how to inspect composites with shearography. Laser shearography has been approved by leading suppliers in the aerospace, automotive, wind turbine and other industries.

### Eco, Comfort, Pro-line System Variants

The Q-810 range is designed to be used for a large array of applications and also by different user skill levels. Therefore we provide three model variants based on a common system platform. The Eco, Comfort and Pro-line models offer increasing levels of capability, functionality and flexibility and can be matched to the customer requirements.



# Technical specifications

Field of view	W x D = 300 mm x 200 mm
Inspection speed	Typically 300 mm x 200 mm / 10 s
Max. pressure difference	150 mbar 50 mbar hold, 100 mbar test
Max. object curvature	Flat to +/- 850 mm radii with standard seal
Vacuum hood dimensions	W x D x H = ca. 430 mm x 280 mm x 315 mm
Vacuum hood weight	~7.5 kg
Length Umbilical cable	Standard 10 m
<b>Laser Classification</b>	<b>I</b>

<b>Q-810 Available Options</b>	<b>Eco</b>	<b>Comfort</b>	<b>Pro</b>
<b>BASE CONTROL UNIT</b>			
Sealed robust aluminium case containing all electronics. Mounted on wheels for mobility, filtered cooling air	✓	✓	✓
Built-in electronics, power supply	✓	✓	✓
Industrial Pentium PC, Windows XP	✓	✓	✓
Mouse, Keyboard, DVD-rewriter, network connector	✓	✓	✓
Integrated 17" TFT monitor	✓	✓	✓
Shutter control with interlock circuit	✓	✓	✓
Split electronics rack with storage compartment for hood		✓	✓
Piezo system for Phase stepping		✓	✓
Key interlock for laser illumination	✓	✓	✓
Computer controlled camera functions			✓
Connection for external Q-800 Sensor		○	✓
<b>VACUUM HOOD</b>			
Vacuum Hood with Handles	✓	✓	✓
2 button control system	✓	✓	✓
Single interface connector to electronics	✓	✓	✓
Standard Seal adapter	✓	✓	✓
Curved Seal adapters	○	○	○
10 m umbilical cable	✓	✓	✓
Extension to umbilical cable	○	○	○
Hood mounted monitor		✓	✓
Touch-Screen Option for Hood monitor		✓	✓
Automatic Feet adjustment		✓	✓
Heat excitation device		○	○
High-Resolution Sensor		✓	✓

<b>SOFTWARE</b>			
Adjustable Pressure Control	✓	✓	✓
Live Image Display	✓	✓	✓
Fringe Display (Image subtraction)	✓	✓	✓
Contrast adjustment (Fringe image)	✓	✓	✓
Record function (Fringe Image)	✓	✓	✓
Adjustable laser power		✓	✓
Phase shifting for Fringe image		✓	✓
Real-time phase shifting		✓	✓
Demodulation of phase image		✓	✓
Visualisation of results		✓	✓
Image Filter Options		✓	✓
Improved Fringe Image and Phase image		✓	✓
Graphical functions		✓	✓
Automatic data storage functions		✓	✓
Recordable Measurement Series		✓	✓
Automatic Object calibration			✓
Defect Sizing			✓
Automatic Image optimisation			✓
Defect Annotation			✓
<b>EMC COMPATIBILITY</b>			
EMC approved system to DEF STAN 59-411	○	○	○
<b>TRAINING</b>			
1 Day Training at Dantec Dynamics	✓		
2 Day Installation and Training at customer site		✓	✓
1 Day Application Training at customer site	○	✓	✓
Certified NDT Level 1 / 2 Training to ASNT or EN standards	○	○	○

The specifications in this document are subject to change without notice

○- Option

