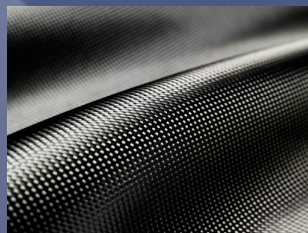




# DolphiCam©

Ultrasound Video Camera  
for Test and Inspection  
of Composite Materials (CFRP)

May 30<sup>th</sup> 2013



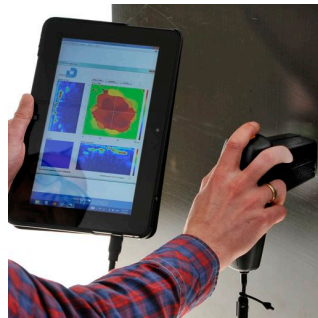
# Product Features

- Designed for CFRP (Carbon Fiber Reinforced Plastic)
- High resolution 2D & 3D video images
- Very user friendly – easily operated by non-experts
- 16,000 transducer elements
- A-, B-, and C-scan
- Amplitude and Flight-of-Time
- Dry (smooth surfaces) or wet coupling
- Compact and ergonomic
- Very price competitive

## Typical Application Areas

### Impact Delamination

Low velocity impact in CFRP can cause subsurface defects resulting in damages like delamination in specific interfaces of the laminate.



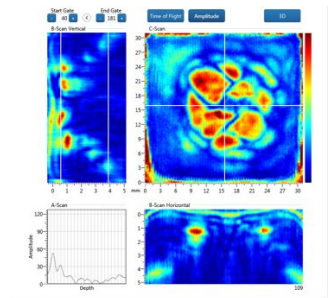
High resolution Image showing size and depth delamination in multi-layer CFRP.

## Software and Presentation

### Amplitude

With easy gating you can view defects inside composite materials.

Set gating between transmission point and backwall to display images based on amplitude of reflected pulses inside the material.



### Bonded Skin-Stringer Structures

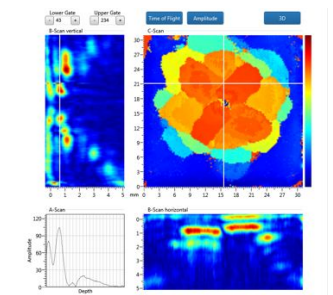
Bonding with adhesives are well suited for CFRP structures, but debonding is critical. The precise detection of any debonding is required for aircraft maintenance. Images are showing normal bonding between skin and stringer and the start of a debonding.



### Time-of-Flight

Using time information in the reflected pulses a Time-Of-Flight image is created.

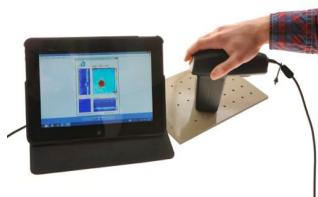
Different colors visualize the different depths of your defects.



### Borehole Flaking

DolphiCam meeting standard specification under shop floor conditions.

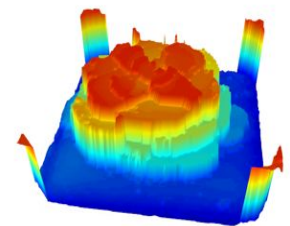
Images showing pulse echo inspection of flaking around a rivet hole in CFRP. Time of Flight C-scan for “view through” and gated C-scan for defect analyzes.



### 3D

DolphiCam software includes an easy to operate 3D viewer.

You can easily view, rotate and zoom your 3D image in live video or still image.



## Unique Transducer Technology

DolphiTech has developed a novel ultrasound transducer design that produces high-resolution images.

An ultrasound transducer is a device that transmits and receives ultrasound signals, and converts electrical energy into acoustic energy and vice versa. Our technology has industrialized well-known principles into a complete new design, product and production process.

## User Friendly Dry Coupling Solution

Acoustic coupling medium means a material that transmits the ultrasound waves (acoustic energy) from the ultrasound transducer into the object for inspection, and back to the transducer again. In many applications a wet coupling medium is used (e.g. gel). Our product features a dry coupling membrane that provides a large contact area to be imaged at the same time.

## Analogue Electronics

The analogue electronics deliver the electrical signals to the transducer that transforms the electrical pulses to acoustic pulses. Further, the received ultrasound echoes are amplified by the electronics through a low-noise, high frequency receiver chain.

DolphiTech develops the electronics in close cooperation with Norwegian partners. Concepts and components from other technology platforms are combined into a unique analogue electronics system especially designed for low cost and high performance.

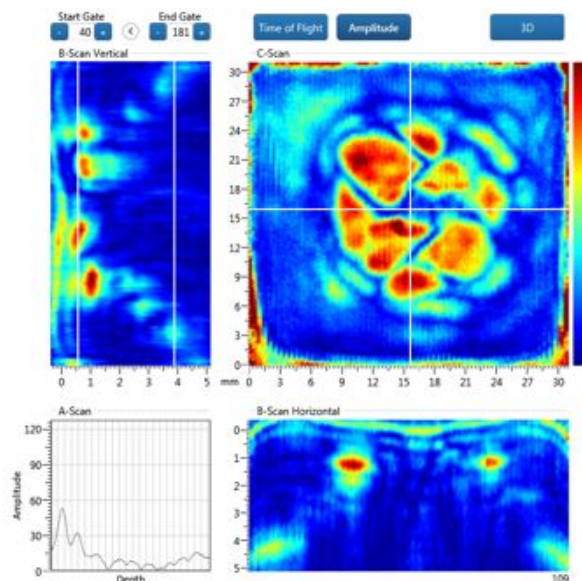
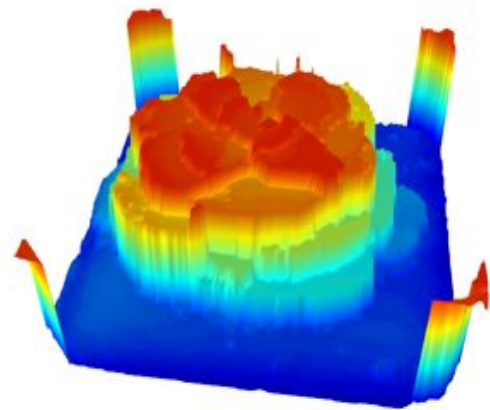
## Digital Processing

The digital processing algorithms convert the ultrasound echoes into ultrasound images.

The image and signal processing algorithms are developed to be optimal for the transducer design and object for inspection under different conditions. The product is controlled by a FPGA “processor”. By user interfaces on the product and the related PC software, the user can select between different processing algorithms in the processor and also different image enhancement options, to visualize high-resolution ultrasound images under very different conditions.

“ The new system will speed up NDT procedures in manufacturing and maintenance and will help the users to save time and money.

Martin Bach, NDT specialist at EADS Innovation Works



# DolphiTech AS

DolphiTech provides advanced ultrasound-based cameras for 2D and 3D inspection and analysis of materials. We utilize an advanced technology developed by a team of experts in ultrasound, analog and digital electronics.

The technology is unique in the global context, and DolphiTech has established co-development relationships with international agencies and research groups.

## Specifications:

Dimensions	115 x 170 x 68 mm / 4.5" x 6.7" x 2.7"
Weight	0.470 kg / 1.04 lbs
Detection and inspection	CFRP composite materials < 8 mm thickness and 30 mm x 30 mm capture size
Transducer	16.000 elements
Power	Re-chargeable Li-ion battery, charged via USB or cable
Battery life	≈ 5 hours of continuous video scanning
Communication	USB 1.1 / 2.0
Operating temperature	0° to 40° C / 32° to 104° F
Storage temperature	-20° to 65° C / -4° to 149° F
Ingress Protection	IP54 (Protection for dust and splashing water from all sides)
EMC	EN 61326:1997+A1:1998+A2:2000+A3:2003 / FCC Subpart 15
Electrical safety	EN/IEC 61010-1:2001
Software and Display	PC and Tablet devices running Windows XP and later or Windows 8. Automatic firmware and software updates.

Address:  
**Dolphitech AS**  
Raufoss Industrial Park, Building 1,  
Enggata 40, 2830 Raufoss, Norway

Email:  
[post@dolphitech.com](mailto:post@dolphitech.com)  
Web:  
[www.dolphitech.com](http://www.dolphitech.com)