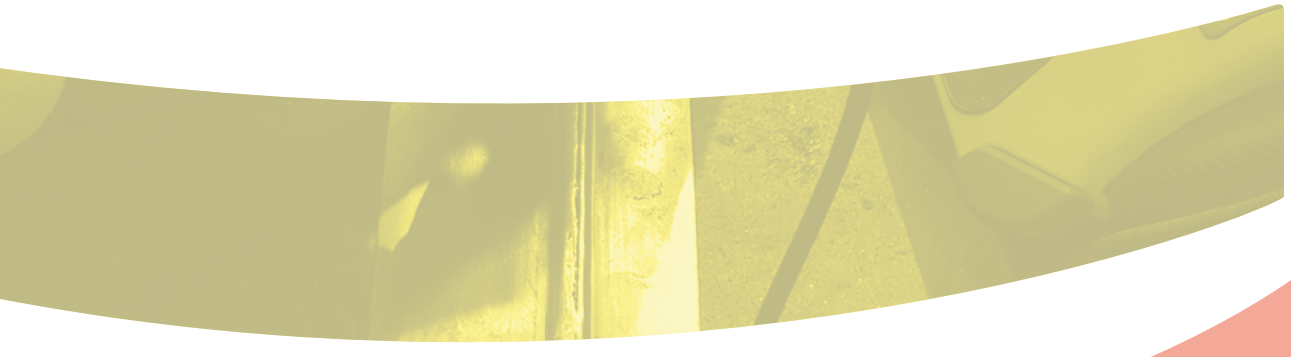
TSC

Part of Eddyfi Technologies

PACE™

Portable ACFM® Crack Evaluation



Portable ACFM® Inspection Technology

TSC's portable ACFM® solution, PACE™, provides the end user all the functionality and advantages of Alternating Current Field Measurement (ACFM®) NDT inspection technology in a lightweight, hand-held, rugged instrument; partnered by a new probe design - SENSU™.

PACE™ has been developed to offer operators a robust, single user ACFM® instrument with ergonomic design features enabling easy operation, with left or right hand use. The large, high contrast, strengthened LCD screen is ideal for sunlight viewing and the unit is sealed to IP65. Supported by long battery life, PACE™ is the ideal on-site inspection solution for topside crack detection.

Enhanced software enables the creation and delivery of inspection reports detailing defect sizes, locations and scans. The on-board camera enriches reports, giving inspectors the option to use detailed imagery from the inspection site.

Full records of all scan data are stored for audit tracking and ACFM® desktop software supports further investigations of the scan and inspection data, enabling bespoke report generation.

USB 3.0 connections are available together with standard VGA output to make data communication simple and flexible.

PACE™ Features:

- Reliable, repeatable crack detection using ACFM®.
- Accurate defect sizing, length and depth.
- Inspection through coatings.
- No cleaning required.
- No in-situ calibration.
- Integrated, portable, robust unit (IP65).
- Long life battery (8+hrs).
- Toughened, high contrast LCD screen.
- Desktop & in-car charger.
- Built-in camera, for on-site images.
- 4 secure corner harness points.
- Glove accessible features.
- Interface design enables single-handed operation during inspection (left or right).

SENSU™ Probes

TSC's functional design philosophy continues in the new and innovative probe range SENSU™. These pencil style ACFM probes, with a straight nose and right angle nose, have been designed to perform easy, continuous scanning whilst being able to gain access to challenging tight angle inspection areas. As "intelligent" probes, the SENSU™ range stores configuration information and provides instant feedback of scanning status whilst in use.

SENSU™ Features

- Ergonomic design for hand-held scanning.
- Highly wear resistant ceramic nose.
- Straight & right angled nose configurations.
- LED indicator for function status.
- Hot swappable.

Common Applications

- ✓ Single person operation.
- ✓ Rope access inspections.
- ✓ Weld inspection.
- ✓ Cranes & towers.
- ✓ Refinery piping & vessels.
- ✓ Painted/coated structures.
- ✓ Pipeline welds.
- ✓ Bridges & infrastructure.
- ✓ Rail wagon integrity.
- ✓ Topside offshore/onshore structures.

PACE™ ACFM Software

Brand new high performance software has been developed to work with the operator creating inspection reports detailing defect sizes, locations and scans.

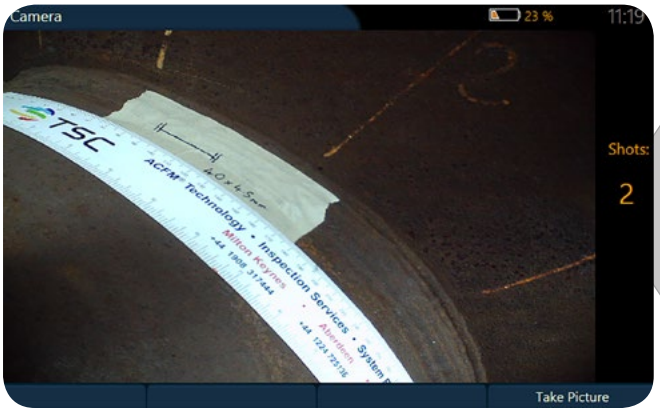
An on-board camera enriches the ACFM® reports, providing supporting imagery from the inspection site for reference. Full records of scan data are able to be stored for audit tracking and new desktop software supports the operator and client further, with functions to investigate scan data and create bespoke client/job focussed reports.

Desktop software will store all inspection data and allow the history and audit trail of inspections to be maintained and referred to.

PACE™ ACFM Reporting

Creating professional site reports is fast and simple with the PACE™ instrument. A couple of button presses can quickly transform any data page into a report with full location information, relevant data traces, defect sizes, notes entered plus any pictures taken of the location. The report also contains all probe and instrument details and an inspector sign off box.

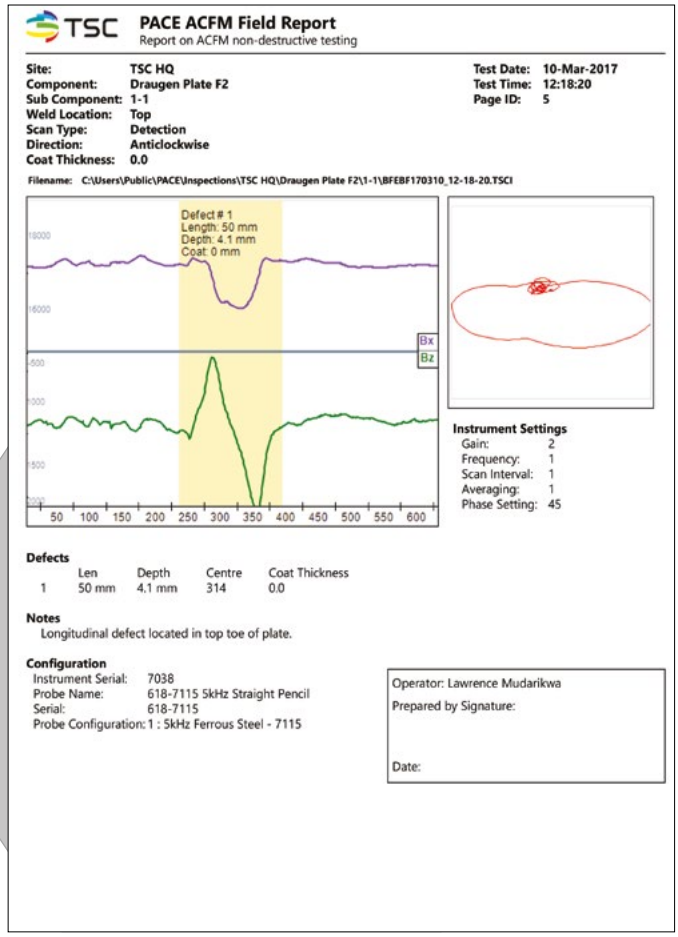
These reports can then be stored in both .pdf and .docx format on the PACE™ internal drive and downloaded onto a removable USB stick or drive.



Above: Photograph of inspection area using the on-board camera.
Right: An example of a PACE ACFM inspection field report.

PACE™ Software Features

- Full scan and data records for audit.
- Simple field report generation.
- User-friendly, crisp, intuitive interface.
- Easy access key functions.
- Time-saving pre-inspection configuration.
- Instant presentation of ACFM® scan data on colour displays.
- 'Intelligent' assistance during ACFM® defect sizing.
- Image capture, automatically associated with the inspection data and reports.
- On-board generation of Inspection reports generated to .pdf & .docx, with images.
- Support for all major previous ACFM® software features, e.g. markers, regions, notes, replay.
- Fast data/report backup to standard USB.
- Data search/filtering options by location/ component/operator etc.



TSC **PACE ACFM Field Report**
Report on ACFM non-destructive testing

Site: TSC HQ
Component: Draugen Plate F2
Sub Component: 1-1
Weld Location: Top
Scan Type: Detection
Direction: Anticlockwise
Coat Thickness: 0.0

Test Date: 10-Mar-2017
Test Time: 12:18:20
Page ID: 5

Filename: C:\Users\Public\PACE\Inspections\TSC HQ\Draugen Plate F2\1-1\BFEBF170310_12-18-20.TSCI

Defect # 1
Length: 50 mm
Depth: 4.1 mm
Coat: 0 mm

Bx
Bz

50 100 150 200 250 300 350 400 450 500 550 600

Instrument Settings
Gain: 2
Frequency: 1
Scan Interval: 1
Averaging: 1
Phase Setting: 45

Defects

	Len	Depth	Centre	Coat Thickness
1	50 mm	4.1 mm	314	0.0

Notes
Longitudinal defect located in top toe of plate.

Configuration
Instrument Serial: 7038
Probe Name: 618-7115 5kHz Straight Pencil
Serial: 618-7115
Probe Configuration: 1 : 5kHz Ferrous Steel - 7115

Operator: Lawrence Mudarikwa
Prepared by Signature:
Date:

PACE™ System Specifications	
Unit Weight	2.5 kg
Unit Size	295 x 198 x 75mm
Ambient Temperature	-20°C to 60°C
Environment Protection	IP65
Screen	Built-in TFT display, 17.7 cms (7 inches). Optically bonded, chemically strengthened glass,
Outputs	External display, VGA
Battery Life	8+ hours
Battery Information	3.5 hrs recharge time (from empty), 14.4V, 98Wh Desktop charger and in-car charger
Data Storage	32GB Internal Storage and external USB storage device
Probe Cable Length	1.5 metres (standard).
Communication Option	USB 3.0
Language	English
Harness points	Four corner harness points
On-Board Camera	5 Megapixels
SENSU™ Probes	Straight nose and Right-Angled nose, 5 kHz, hot swappable.
Transport Case	Rugged, wheeled PELI™ case: L 558mm x W 355mm x D 228mm

PACE™ - Standard Kit

PACE™ ACFM® Instrument.
618 SENSU™ Pencil Probe with Straight Nose.
619 SENSU™ Pencil Probe with Right-Angled Nose.
SENSU™ probe cable.
SENSU™ Checker.
Battery charger, desktop battery dock and power cable.
12/24V vehicle charger lead.
Type 181 ferrous ACFM® function check block (ASTM)
Wireless keyboard.
Desktop software on USB stick.
Shoulder strap.
Desktop/ field stand.
Transit case.

Annual Maintenance Package includes:
Annual calibration of instrument and probes.
Software Licences and updates.
TSC technical support at discounted rates.

Optional Probe:
SENSU™ 5kHz Pencil Transverse, right-angled (620)
SENSU™ 50kHz Pencil Probe Straight (624)
SENSU™ 50kHz Pencil Probe Right Angle (625)
SENSU™ 50kHz Pencil Probe Transverse (626)

Customised probes are available on request.

TSC ACFM® Training

For those new to ACFM® TSC are able to provide ACFM® Level 1 and Level 2 operator training courses and examinations, to recommended practice SNT-TC-1A (2016). These are delivered over a four day training program with written and practical examinations on day five. PCN and CSWIP courses are also available through other training providers.

If you already have ACFM® qualifications the **Accelerated Work Experience Course** offers the candidate a wide variety of ACFM® inspection experience, as well as a fast-track route to gaining further certification.

Up to 50% of the practical experience time required for certification may be achieved under the Accelerated Work Experience course, the duration of which may be weighted by a factor of 5. This means for instance that an operator who requires 3 month practical experience for ACFM® L1 certification can gain half of that experience by completing just 7 days of the Accelerated Work Experience course.

Depending on the candidate's experience, specimens will be selected with a varying degree of difficulty ranging from flat plates with simple longitudinal defects, to complex nodes with real fatigue cracks. The majority of the inspections will be carried out using TSC's AMIGO™ instruments. However, depending on availability at the time or product ownership, inspections can be conducted using the new PACE™ instrument or U31™ subsea equipment.

For further information on training course content and availability email info@tscis.com .

Advantages of ACFM®

Feature	ACFM®	MPI	Conventional Eddy Current
Reduced dependence on operator competence. • Detection reliability and repeatability. • Confidence in integrity data.	✓	✗	✗
Detection through coatings. • Avoids cost and disruption of coating removal.	✓	✗	✓
Detection in normal ambient light. No pollutants used.	✓	✗	✓
Detection in Duplex and non-magnetic metals.	✓	✗	✓
Provides accurate and auditable inspection records. • Enables effective integrity and risk management. • Supports regulator verification and audits.	✓	✗	✗
Determines crack length and depth without calibration. • Allows crack criticality assessment.	✓	✗	✗
High POD and low false call rate. • Avoids cost of unnecessary repairs and rework.	✓	✗	✗

Milton Keynes

TSC Inspection Systems
Davy Avenue
Knowlhill
Milton Keynes
MK5 8PB
United Kingdom

+44 (0)1908 317 444

info@tscis.com

Aberdeen

TSC Inspection Systems, Unit D17
Wellheads Industrial Centre
Wellheads Crescent
Dyce, Aberdeen
AB21 7GA
United Kingdom

+44 (0)1224 725 136

rentals@tscis.com

Singapore

TSC Inspection Systems Pte Ltd
Loyang Offshore Supply Base,
23F Loyang Crescent, Box 5188
Blk 602 Tops Avenue 6
SINGAPORE 509022

+65 6543 9728

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