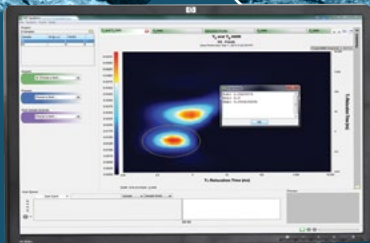
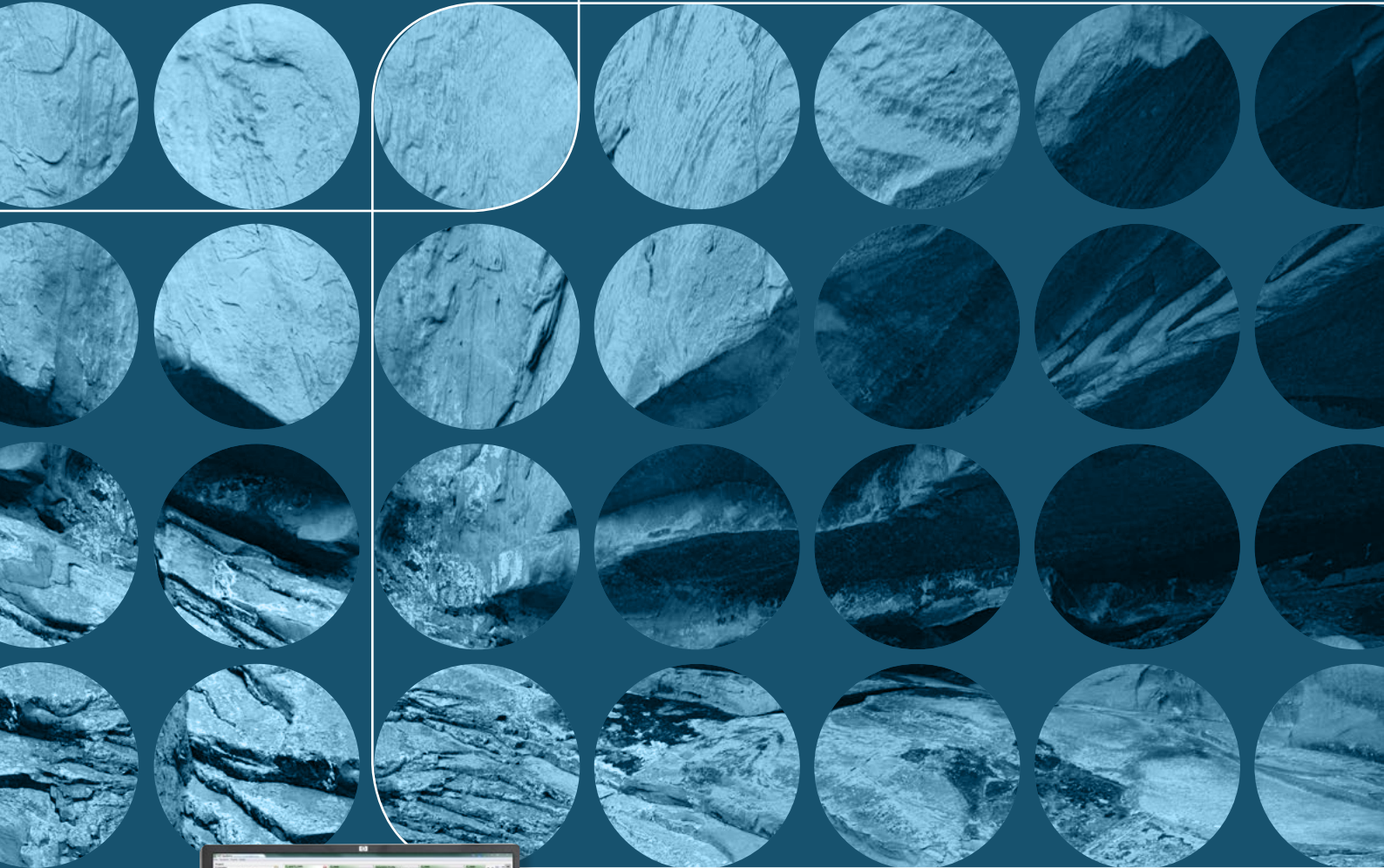


GeoSpec core analysis



The Business of Science®



GeoSpec A Design Evolution

GeoSpec core analysers provide cutting edge solutions for the core analyst

Petroleum engineers constantly strive for a better understanding of their reservoirs, which requires extensive and reliable data. GeoSpec NMR core analysers provide measured and modeled data directly from the fluids in the rocks to complement other technologies and help solve the reservoir puzzle.

The **GeoSpec** range of instruments is the result of a successful long-term collaboration between Oxford Instruments and Green Imaging Technologies (GIT), the world leaders in hardware and software for NMR core analysis. First introduced in the mid-1990s, the **GeoSpec** now has well over 100 installations worldwide in oil companies, service companies and academia.

The **GeoSpec** includes instruments from 2MHz to 23MHz operating frequency, handling samples from ½ to 6 inches diameter, with integrated software and accessories to suit all users from routine core analysis to advanced petrophysics research.

Entry level **GeoSpec** systems come complete with **LithoMetrix™** software which carries out routine measurements such as T_1 and T_2 -based pore size distributions, porosity, and fluid mobility measurements such as Free Fluid Index (FFI), Bound Volume Irreducible (BVI) and Clay Bound Water (CBW).

Higher performance hardware incorporating pulsed field gradients is matched with greater software capability including measurement of hydrogen index, diffusion, and fluid typing by 2-D data mapping.

Top of the range **GeoSpec** systems include saturation profiles, spatially-resolved T_2 distributions, and GIT's patented capillary pressure (Pc) measurement package, GIT-CAP™. GIT-CAP allows users to obtain Pc measurements 5 times faster, while getting up to 10 times as many data points per scan, compared to traditional measurement techniques.

With the optional P5 Cell for overburden studies, users can perform analysis on 1" and 1.5" diameter samples at up to 5,000 psi of pressure and at temperatures to 100°C.

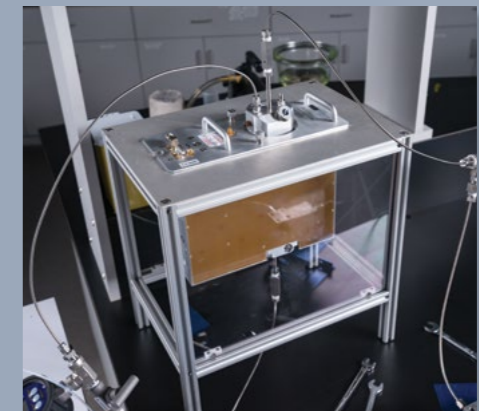
All **GeoSpec** systems include Oxford Instruments' revolutionary Q-Sense signal enhancement technology, which provides industry-leading short echo spacings (essential for measurements on tight rocks and shales, which have a high proportion of small pores) while maintaining high signal to noise ratios (SNR). This unique combination allows measurements to be made up to four times faster, with echo spacings several times shorter, than in previous instruments. Q-Sense also allows successive measurements to be made on cores of varying salinity, without the need to retune the probe between samples.

The **GeoSpec** Advantage

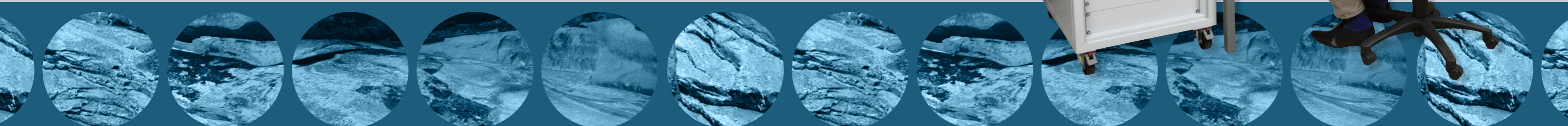
- High SNR lets you get more from your sample and collect better data in less time.
- High sensitivity for measurements on low porosity rocks.
- External probe power dissipation for reduced thermal effects and high duty cycles.
- See tight pore networks – Q-Sense signal enhancement means seeing extremely small pores, down to 1 nanometer.
- Fastest, most accurate and data rich capillary pressure measurement available (GIT-CAP).
- 1D and 2D gradients open up advanced petrophysical studies. 3D gradients allow 3D imaging (MRI) of core samples.
- 2MHz models for optimum well log calibration; 12MHz and 20MHz models for greater sensitivity with low porosity samples.
- Sample size from ½" diameter to 6" diameter
- Overburden studies up to 5000psi and 100C, using dedicated cell with multiple levels of safety features

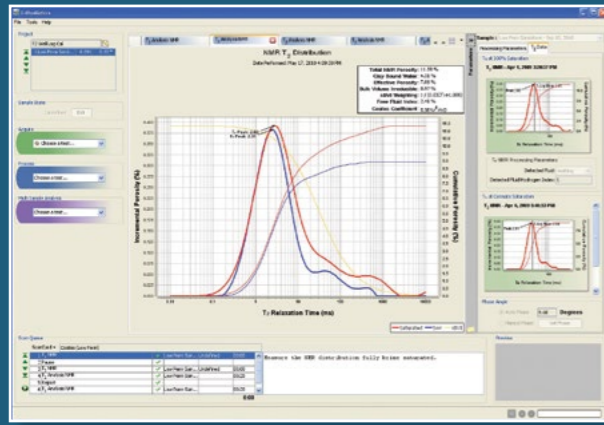
P5 cell for overburden studies

- Up to 5,000psi and 100°C
- Maintain pressure outside the instrument
- Many enhanced safety features

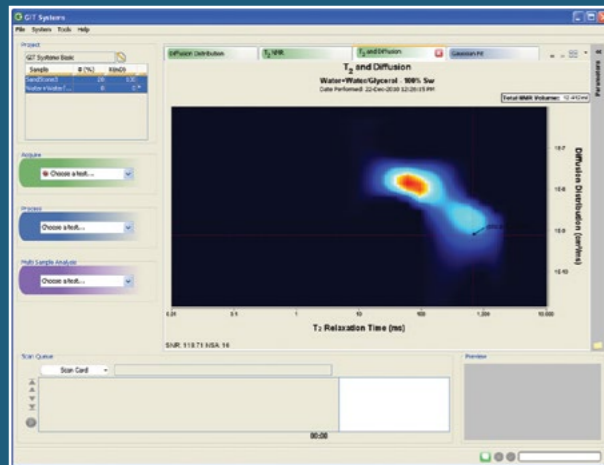


Complete Cutting Edge Solutions from the Industry Leaders





During the T_2 distribution measurement, BVI, FFI, CBW and other fluid mobility parameters are measured.



Mapping of Diffusion distribution with T_2 relaxation times, utilising **GeoSpec's** gradient option, can be used for fluid typing.

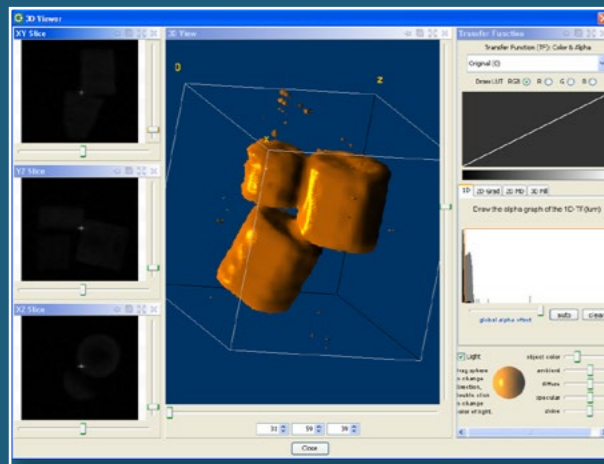
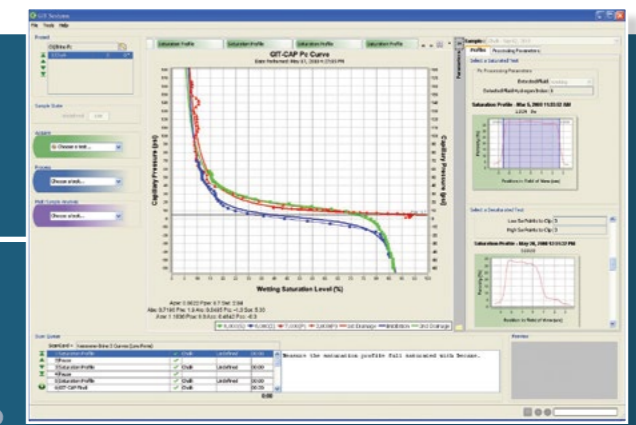
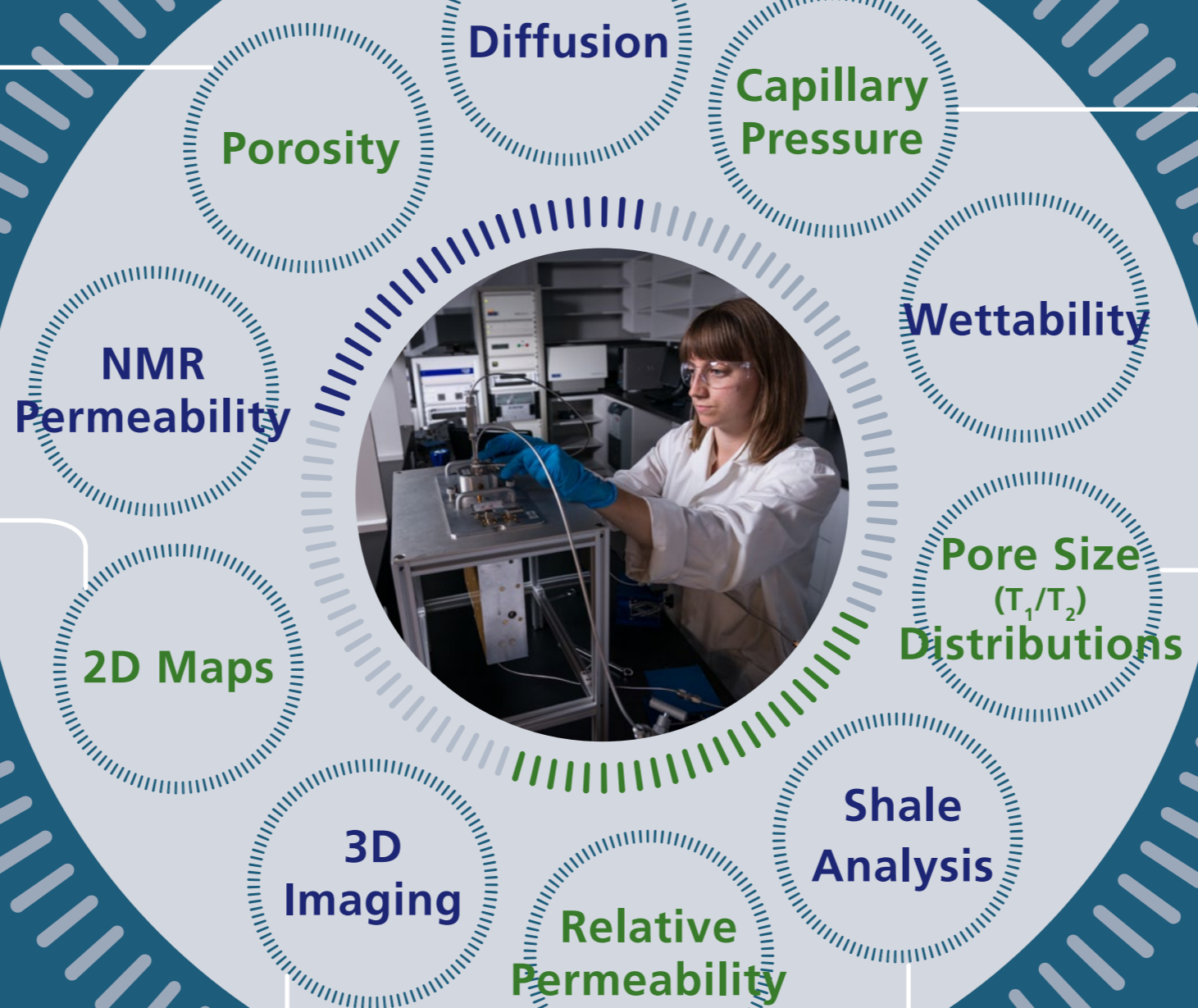
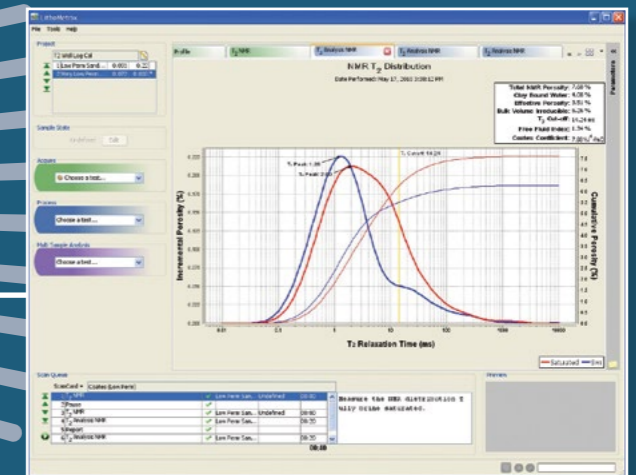


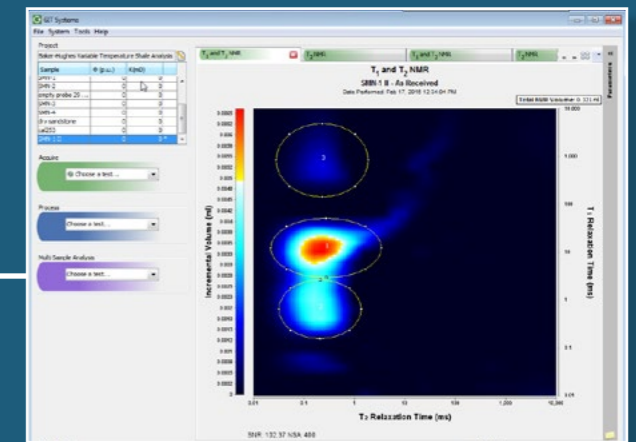
Image the fluids within the pore network in three dimensions.



Patented GIT-CAP Capillary Pressure measurement is 5x faster and provides 10x more data and is exclusive to **GeoSpec**.



Pore Size Distributions from T_2 NMR measurements, are made more accurate with **GeoSpec's** higher signal to noise ratios and industry-leading short echo times.



2D maps help differentiate the populations of different fluid types.

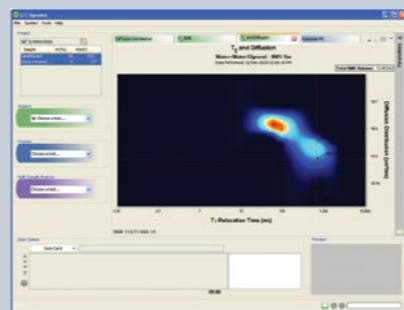
Harness the power of NMR



Software that works for you

All **GeoSpec** rock core analysers come complete with **LithoMetrix** software, which acts as the user interface and performs all instrument management and basic core analysis functions. LithoMetrix can be upgraded to **GIT Systems** to add more advanced measurements such as 2D maps, diffusion studies, capillary pressure and saturation profiles. Users of **GeoSpec** instruments equipped with 3D gradients can maximise the performance of the instrument using the **GIT Systems 3D Imaging** software.

- Intuitive user interface, designed in collaboration with professional core analysts.
- Diagnostic aids, easy calibration tools, and instrument performance database.
- Routine measurements pre-packaged with automatic calculations.
- Project and sample results database maintained automatically
- “Scan cards” allow multiple measurements to be set up in advance, to run unattended.
- Software used, tested and continually improved in our own commercial core laboratory.
- Multi level software means it can be tailored to meet users specific needs.
- **GIT App Builder** designed to allow advanced users to build, test and deploy their own pulse sequences.



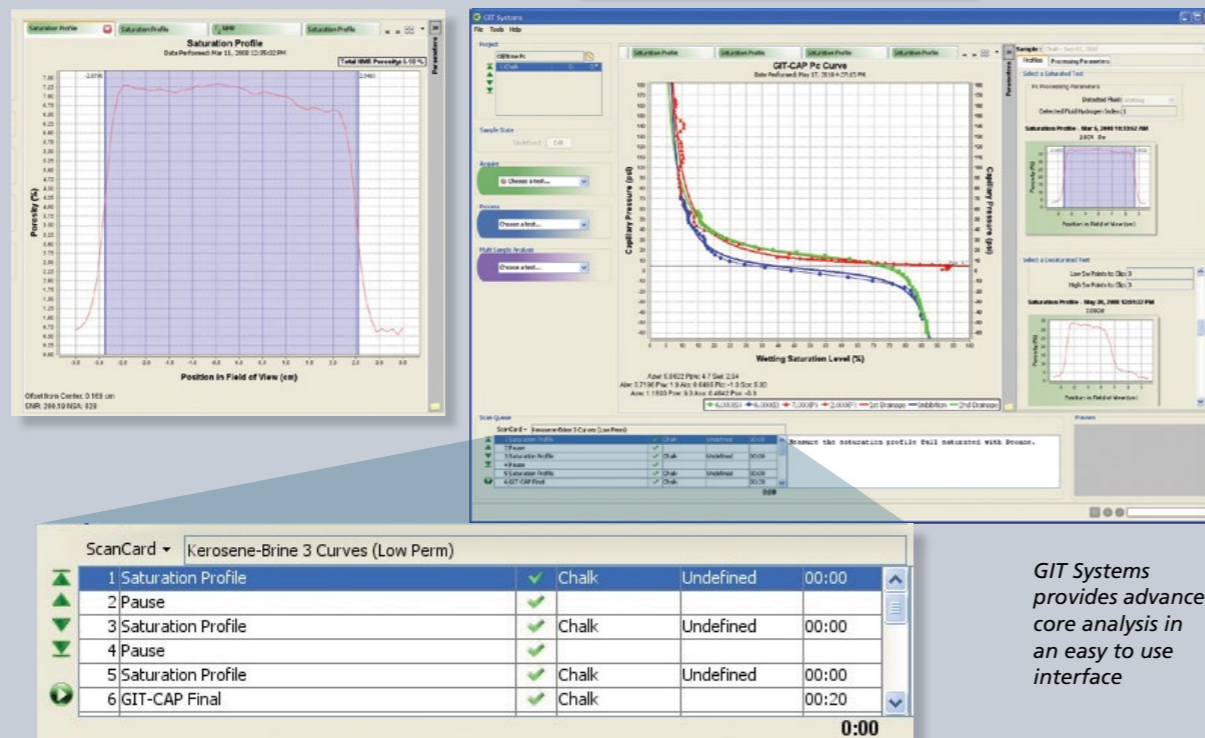
Green Imaging Technologies holds more than 10 patents related to the protocols, techniques and functionalities available in our software. A patent summary is provided on our website (www.greenimaging.com).



GIT App Builder

development tool is included in the GIT Systems product line

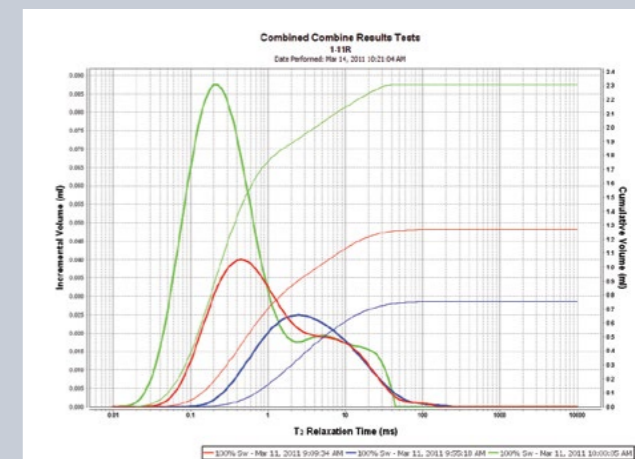
- Provides a full development environment.
- Design, develop and test pulse sequences.
- Includes sample pulse sequences.
- Allows advanced users to develop new sequences and deploy them to **GIT Systems**.



GIT Systems provides advanced core analysis in an easy to use interface

Industry leading performance

- Collect better data in less time with high SNR.
- Q-Sense signal enhancement allows measurements in extremely small pores (≥ 1 nanometer).
- Fastest, most accurate and data rich capillary pressure (GIT-CAP) measurement available.
- Perform overburden studies safely on conventional and unconventional samples.



Shorter Taus reveal more porosity

Flexible configurations for any application

Configure the system to your application

- Sample size from 1/2" diameter to 6" diameter
- Magnets from the standard 2MHz up to 20MHz for faster measurements or measurements requiring extremely short echo spacing.
- 1D and 2D gradients for advanced petrophysical studies, and 3D gradients for 3D imaging of core samples.
- A range of electronics can be tailored to meet the needs of individual applications.
- Multi level software allows users to match their application needs with software capabilities.



A range of probes is available to handle different core diameters

Global Support

The Oxford Instruments – Green Imaging Technologies partnership has experience of supplying systems all over the world, with instruments installed on 6 continents. Our hardware and software is developed, built and tested in-house.

We have our own core analysis laboratory, providing a service specialising in difficult rocks, which can be used to validate your own results or act as a backup to your own production lab. We have support bases in UK, the USA, Canada, and China, as well as a network of partners and resellers with global reach. No matter where you are located, our global support network can provide prompt, personal service.



Oxford Instruments Magnetic Resonance

For more than 15 years, Oxford Instruments has been the industry standard for NMR instrumentation for core analysis. With over a hundred installations, Oxford Instruments truly understands the needs of core analysts, whether they be in oil companies, oilfield service companies or academia.

Innovation has been the driving force behind Oxford Instruments' growth and success ever since the business spun out from the University of Oxford over 50 years ago. It is now a global company with over 1,900 staff worldwide and a listing on the London Stock Exchange (OXIG).

Oxford Instruments Industrial Analysis
For more information: industrial@oxinst.com
www.oxford-instruments.com

UK

Tubney Woods, Abingdon
Oxfordshire, OX13 5QX, UK

Tel: +44 (0) 1865 393 200

Fax: +44 (0) 1865 393 333

USA

300 Baker Avenue, Suite 150
Concord, MA, 01742, USA

Tel: +1 978 369 9933

Fax: +1 978 369 8287

China

Floor 1, Building 60, No.461, Hongcao Road,
Shanghai, 200233, China

Tel: +86 21 6073 2925 **Fax:** +86 21 6360 8535

Green Imaging Technologies

Green Imaging Technologies is the world-leader in developing innovative solutions for lab-based rock analysis using Nuclear Magnetic Resonance (NMR). GIT's products and services offer fast, accurate, non-destructive analysis of rock core samples used by the oil and gas industry in exploration and reservoir characterisation.

Over the last decade, GIT's product offerings have evolved and expanded to include a full suite of routine and advanced core analysis tools. A culture of continual innovation has driven the company to become the industry leader in NMR core analysis. From prediction to production, GIT provides the solution.

For more information: info@greenimaging.com

www.greenimaging.com

Canada

520 Brookside Drive, Suite B
Fredericton, NB, Canada, E3A 8V2

Toll Free: +1 888 944 8462

Tel: +1 506 458 9992

Fax: +1 506 458 9615

This publication is the copyright of Oxford Instruments plc and provides outline information only, which (unless agreed by the company in writing) may not be used, applied or reproduced for any purpose or form part of any order or contract or regarded as the representation relating to the products or services concerned. Oxford Instruments' policy is one of continual improvement. The company reserves the right to alter, without notice the specification, design or conditions of supply of any product or service. Oxford Instruments acknowledges all trademarks and registrations. © Oxford Instruments plc, 2015. All rights reserved. Ref: CAB-07-15

