



ImaCore 3017™ – 3D Rock Core Imager

**INNOVATIVE TECHNOLOGY
FOR ●●●●
ROCK CORE IMAGING**



www.greenimaging.com

+1 (506) 458-9992

www.mrsolutions.com

+44 (0)1483 532146

ImaCore - Variable Field, Rotating MRI

Cryogen Free MRI – ImaCore 3017™

The ImaCore 3D rock core imaging system is the result of a partnership between Green Imaging Technologies (GIT), an established leader in nuclear magnetic resonance (NMR) rock core analysis software, and MR Solutions, a leader in magnetic resonance imaging (MRI) instruments. This partnership has resulted in a **powerful MRI rock core instrument** with an easy to use, yet robust user interface.

In general, rock core analysis is an exercise in providing measured data, but equipment limitations can require that the final analysis involve a theory of what is happening at the pore level. By using higher field MRI instrumentation, limitations of resolution are virtually removed, meaning one can bolster the theoretical with actual images of all the fluid present in the rock, allowing a better understanding of the pore network itself.

The ImaCore has been **optimized for core analysis** with dedicated hardware and pulse sequences for the standard and advanced core analysis techniques. The software packaged with the instrument, GIT Systems 3D Imaging, includes a pulse sequence development environment so researchers can develop their own sequences.

ImaCore will be a key tool for revealing the missing pieces and completing the reservoir puzzle.

ImaCore provides an **adjustable field of 0.1 to 3T** providing flexibility to perform standard hydrogen experiments at different frequencies; or combine the field strength and probe frequency to measure other nuclei, such as Fluorine (19F), Carbon (13C), and Sodium (23Na).



ImaCore 3017™

This **stable, cryogen free, variable field magnet provides maximum usability** when combined with the robust 3D imaging software, GIT Systems 3D Imaging. Users can quickly and easily obtain high resolution three dimensional (3D) images of all the fluid in the sample. Sample sizes can be standard 1" or 1.5" core plugs, and full diameter core.

The large dimensions of the ImaCore 3017 magnet also allows for long core studies, and lends itself well to the use of flow cells within the instrument to perform flow studies. Images can be obtained in 2D and 3D in seconds rather than hours. The temporal resolution possible with the higher field allows for **viewing of the flow front in real time.**

The ImaCore magnet is mounted on a rotating housing that allows users to perform measurements orientated to the horizontal, vertical or any angle between.

Complete the reservoir puzzle with an ImaCore 3D imaging system.

FEATURES & BENEFITS

SUPERCONDUCTING MAGNET	High performance High homogeneity Stable Almost no fringe field
COMPACT & LIGHT	Small footprint ~220Kg
CRYOGEN FREE MAGNET	No need for liquid Helium Dry Magnet
NO SPECIAL ROOM REQUIREMENTS	No need for quench pipes No Faraday cage No special floor needed
VARIABLE FIELD STRENGTHS	From 0.1T to 3.0T (Rampable) Systems can operate at variable strengths





3D Imaging Software

Software for all user levels

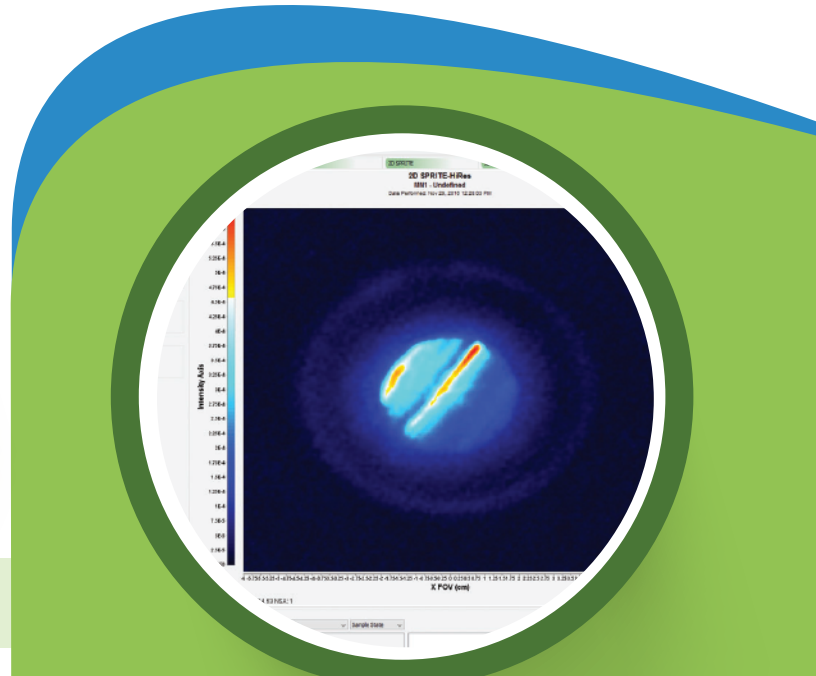
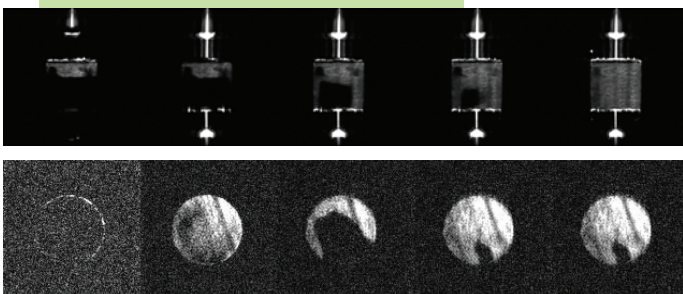
The ImaCore 3D Imaging System comes complete with GIT Systems 3D Imaging software. This software simplifies the acquisition and viewing of images in 3D space. Flow studies can be viewed in real time in 3D allowing users to see the flow front interacting with the entire pore network.

GIT Systems 3D Imaging evolved from a range of products designed to provide both lab technicians and research scientists with a robust, yet easy to use interface to NMR and MRI instrumentation. The 3D Imaging software package builds on the foundation of the industry leading GIT Systems line of products, which have revolutionized how users acquire and process NMR and MRI data.

The 3D Imaging software provides access to NMR applications such as fluid mobility, saturation, porosity, wettability studies, shale analysis, and capillary pressure. It also adds a full suite of 3D acquisitions, processing and viewing capabilities.

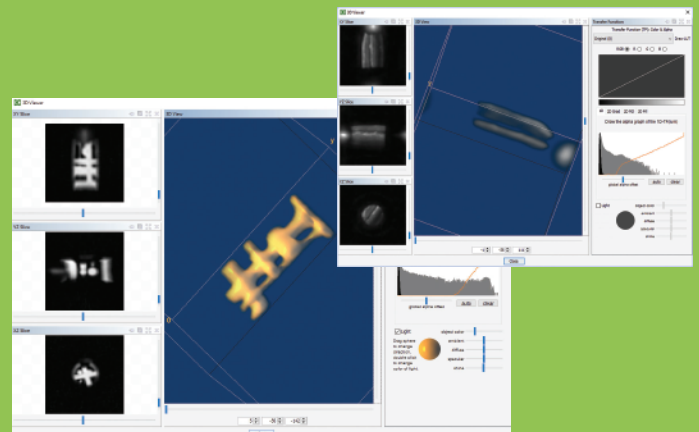
For those users who wish to build their own pulse sequences, the GIT App Builder is packaged with the system. This product is a pulse sequence development tool, which allows users to develop, test and then deploy pulse sequences to the GIT Systems software. For imaging applications, the App Builder is packaged with both the 2D Spiral and 3D Conical gradient routines, allowing users to more quickly develop their own sequences.

Flow front moving through core



INCLUDES THE FOLLOWING IMAGING PULSE SEQUENCES

- 2D spiral SE-SPI
- 2D spiral SPRITE
- 3D conical SE-SPI
- 3D conical SPRITE
- 1D SE-SPI and SPRITE profiles
- 1D spatial T1
- 1D spatial T1-T2 Maps
- 1D spatial T2
- 2D spatial T2
- Spiral 2D Fast Spin Echo Ultra Short TE
- Conical 3D Fast Spin Echo (FSE)
- Out of volume suppression for long cores or 1D profiles
- Slice selection for T2



Specifications - ImaCore MRI

ImaCore MRI

Site Requirements Plug and Play System

Magnet

Field Strength 0.1T - 3.0T (rampable)
Magnet Cryogen-free, Superconducting magnet
Bore size 17cm
Integrated RF Shield Yes
5 Gauss line (from magnet center) 60cm radially x 80cm axially
F.O.V. Elliptical: 100mm x 70mm
Homogeneity Over 30mm +/- 0.1ppm, Over 70mm DSV +/- 1ppm
Magnet Weight 220kg
Dimensions (Including stand) 88cm Long x 77cm Wide x 138cm High

Gradient System

Gradient diameter/height 156/100mm
Strength X - 486 mT/m Y - 470 mT/m Z - 530 mT/m
Rise time @100A, 150V 100 microseconds
Linearity Over 70mm: +/- 5%
Max duty cycle 50%

Electronics

EVO Spectrometer 2TX, 4RX - Optional RX channels in blocks of 4
RF Transmit Amplifier Power 500W
Pre-amplifiers x2, gain 30dB
Pre-amps x2 Noise Figure < 0.3dB
Gradient Amplifiers X, Y, Z
Shim Power Supplies B0 plus 5 channels for second order
Cabinet Size & Weight 158cm High x 78cm Deep x 55cm Wide x 150Kg

Requirements

Electrical-Compressor 380V/50Hz or 480V/60Hz 3phase, 7.5kW
Electrical-Electronics Rack 208-240V 50/60Hz single phase, 6.5kW peak, <3.0kW rms
Water Supply 7 litres/min. minimum

Sample Size

Maximum Diameter 100mm
Maximum Length 70mm



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

For more information
 info@greenimaging.com
 www.greenimaging.com
 Toll Free: +1 888 944 8462
 Tel: +1 506 458 9992
 Fax: +1 506 458 9615

520 Brookside Drive
 Suite B Fredericton
 New Brunswick E3A 8V2 Canada



MR Solutions Ltd.
 MR SOLUTIONS is an independent world leader in MRI technology and the leading developer and manufacturer of superconducting, cryogen-free, benchtop MRI systems. The MRI system's revolutionary cryogen-free magnet technology and small foot print design, enables it to operate in almost any facility and in close proximity to other imaging modalities. MRS has over 30 years of MRI, application, technology hardware & software innovation experience.

For more information
 information@mrsolutions.com
 www.mrsolutions.com
 Tel: +44 (0)1483 532146
 Fax: +44 (0)1483 594084

Ashbourne House
 The Guildway
 Old Portsmouth Rd
 Guildford, Surrey
 GU3 1LR UK



The University of New Brunswick (UNB) MRI Research Center is a key partner for GIT in developing new applications for NMR and MRI technologies. The ImaCore was developed based on foundational efforts by researchers at the UNB MRI Research Center.

For more information
 www2.unb.ca/mri