



• the mq-ProFiler TD-NMR Analyzer

The portable TD-NMR analyzer, without any sample size restriction, for industrial process/quality control and research.

Features:

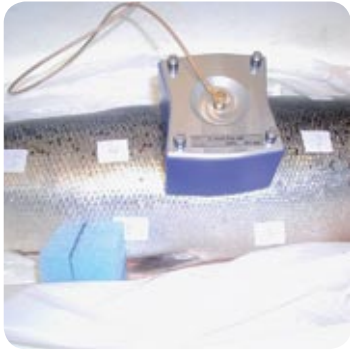
- Hand-held magnet-probe assembly
- In-situ measurement
- Variable measurement depth
- Robust design for mechanical stability
- Negligible artifacts with short dead-time
- Efficient excitation resulting in good signal-to-noise ratio
- Sample-independent tuning
- Relaxation, diffusion-based measurements
- Spatial mapping
- Through-package measurements
- Automation capable

The mq-ProFiler is a compact NMR analyzer equipped with single-sided magnet and RF probes capable of performing 1H-NMR experiments on the surface or near-surface volume elements of arbitrarily large samples. It belongs to the award-winning mq-series and has been used in wide variety of applications for both QC and R&D.

The mq-ProFiler is a ready-to-use single-sided TD-NMR instrument backed-up by Bruker's excellent hardware and electronics design to provide reliable data for QA/QC and research. The instrument needs minimal set-up and controlled by PC through an intuitive, flexible, user-friendly software interface.

Proven Application Areas:

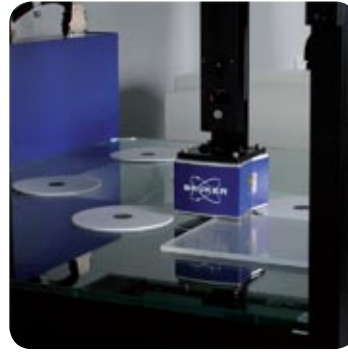
- Rubber & polymer
- Building materials
- Ancient books/papers
- Wood
- Fresh & Processed foods
- Soil composition
- Biomedical research
- Consumer goods



Fat content determination in fresh fish and meat



In-package food analysis



Automated crosslink density mapping

TD-NMR: The Method of Choice

The mq-ProFiler utilizes nuclear magnetic resonance techniques, similar in principle to the high-resolution NMR and MRI, and analyzes the data in time-domain to predict physical and chemical properties of materials. The method is completely non-invasive, and no sample preparation or solvents are involved. Color, opacity, or surface characteristics do not affect the TD-NMR signal. The signal is obtained from the hydrogen nuclei present in a small sample volume in few seconds to minutes. The calibration process is short and very simple. Once, a system is calibrated, there is no need for recalibration unless the hardware is modified.

mq-ProFiler: Software Advantage

The mq-ProFiler software offers user-friendly, push-button routine analysis. Setting up new calibrations is easy, and the software guides the user through this operation. The mq-ProFiler comes with pulse sequences adapted to inhomogeneous magnetic field and the software allows users to control measurement parameters and provides unlimited possibility to implement new pulse sequences. Advanced data processing routines like NNLS fitting or ILT are available.

Applications in Details

- Crosslink density, filler materials, aging in tires (even with steel bars) and other polymers samples
- In-package food analysis: fat content, extent of gel formation, etc.
- Moisture content, porosity, and effect of hydrophobic treatments in building materials
- Study of degradation of paper by looking at balance amongst crystalline cellulose, amorphous cellulose, and water
- Investigation on microscopic mechanism of deterioration of wooden structures/materials
- Fast monitoring of fat content in high moisture foods like fresh salmon fish
- Porosity, separation of oil signal from water signal and drainage/absorption/drying study in rocks and other porous materials
- Contamination (oil) in moisture-free soil
- Skin hydration study
- Fast investigation of cancerous growth
- Surface mapping of material properties aiding failure prediction

Design Advantages

- **Mechanical Stability:**
robust construction essential for use in industrial or production environment
- **Sample-independent Tuning:**
insensitive to the sample's dielectric properties, and hence tuning and matching are not required after loading a sample
- **Negligible Artifacts:**
efficient design of the probe removes the acoustic ringing and background 1H signal, resulting in very short dead time allowing visibility of sample components with fast relaxation properties
- **Variable Measurement Depths:**
hot-swappable probes for probing different depths
- **Short Powerful Pulses:**
allows short high-powered pulses, resulting in good signal-to-noise ratio in the presence of inhomogeneous magnetization field of one-sided magnet

Technical Specifications

- **Magnetic field strength:** 0.4 T
- **Measurement depths:** 0mm, 3mm, 5mm
- **Electronics unit:** broadband (2-65MHz)
- **NMR Measurements:** transverse and longitudinal relaxation, self-diffusion
- **Depth resolution:** 0.5mm, through frequency stepping
- **Lateral resolution:** ~3.5mm

Bruker Optics is ISO 9001 certified.

Magnetic safety measures apply to the operation of the minispec.

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