



FOURIER 80 BENCHTOP NMR

## **A Compact, Cryogen-Free Spectrometer for Everyday Scientific Workflows**

Easy to install. Easy to use. Easy to adapt in any lab.

Innovation with Integrity

# The Smart Choice For Your Lab

## Fourier 80

The Fourier 80 brings high-quality NMR into everyday laboratory workflows by combining a stable cryogen-free magnet, optimized probe technology, and practical automation. Its digital lock, efficient gradients, controlled temperature range, and optional sample changer make routine measurements fast, reliable, and easy to integrate into teaching, QC, and research environments. The result is a compact system that delivers consistent performance with minimal setup and training.

### Versatile Across Scientific Fields

A single compact instrument that supports education, synthesis control, reaction monitoring, pharmaceutical workflows, forensics, and everyday QC - ideal for multi purpose laboratories.

### Accessible for Everyone

Designed so that any scientist, technician, or student can work with NMR confidently. Clear workflows and intuitive operation make high quality data accessible even without specialist training.

### Effortless Operation

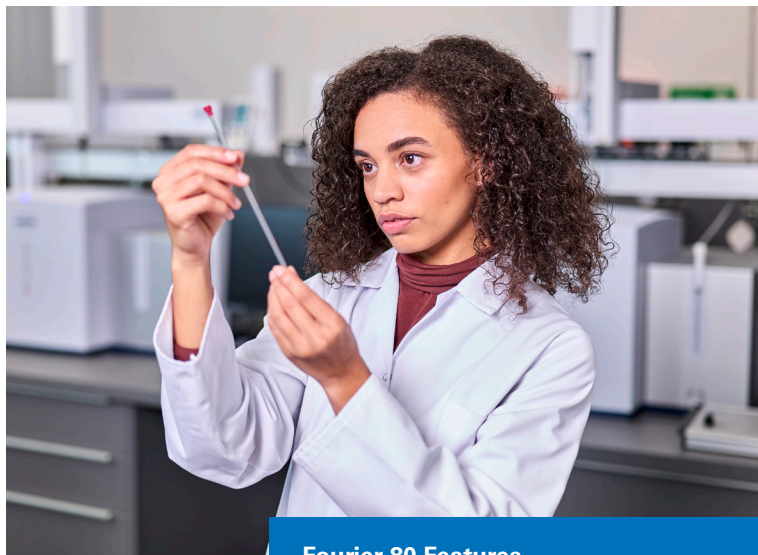
As simple to use as other routine analytical techniques. With guided steps and clear software navigation, users get reliable results quickly, without struggling through complex setup.

### Adjustable Temperature

The optional adjustable temperature control expands application possibilities by enabling reliable measurements across a controlled temperature range.

### Autosampler

An optional autosampler increases efficiency by enabling automated, unattended sample handling for higher throughput and reproducible results.



### Fourier 80 Features

- Multinuclei
- Effortless setup
- Highest throughput autosampler
- End-to-end solutions
- No downtime

### TopSpin

Full compatibility with Bruker's TopSpin software provides seamless access to advanced NMR control, data processing, and professional analysis workflows.

### Compact and Flexible Placement

The instrument fits directly on the bench or inside a fume hood and requires no special room, ventilation, or infrastructure. You simply place it, plug it in, and start working.

### Cryogen-Free Reliability

A permanent, cryogen free magnet eliminates refills and reduces interruptions. This ensures stable performance and low maintenance throughout the system's lifetime.

### Low Total Cost of Ownership

With low power consumption, no cryogenics, no water cooling, and no extra infrastructure, Fourier 80 remains budget friendly to operate and easy to maintain.

### High Quality Data with Bruker Expertise

Delivers trustworthy, publication grade spectra backed by Bruker's decades of NMR innovation. The instrument brings the clarity and certainty of NMR to routine daily tasks.

### Grows with Your Laboratory

Whether for basic teaching, advanced R&D, or routine QC, the system adapts with you: flexible software, multiple nuclei configurations, and compatibility with expert workflows.

## Fourier 80 Configurations

The Fourier 80 is available in four configurations. Each configuration is defined by the nuclei it measures and is optimised for a specific type of workflow and user need.

### Workhorse

for Routine Structure Verification:

#### **<sup>1</sup>H/<sup>13</sup>C (H/C) system**

The Workhorse configuration extends proton measurements with carbon capabilities, enabling routine structure verification. It is suited for chemists who regularly need more confirmation than a simple screening measurement, such as validating reaction outcomes or confirming compound identity. This makes it a dependable everyday tool for laboratories that balance speed with structural confidence.

### Multi-Talent

for Maximum Versatility:

#### **Multinuclear <sup>1</sup>H/<sup>15</sup>N system**

The Multi-Talent configuration offers the highest flexibility by supporting multiple nuclei, enabling a broad range of applications across chemistry workflows. It is designed for chemists and researchers working with diverse compound classes and need the freedom to adapt to changing analytical requirements. The Multi-Talent provides a versatile platform for comprehensive structure elucidation and advanced research applications.

### High Performer

for Fast Analytical Decisions:

#### **<sup>1</sup>H-only system, optimised specifically for <sup>1</sup>H measurements**

The High Performer is designed for users who primarily work with small molecules and need fast, reliable answers. It is ideal for analytical chemists who want a quick pass/fail result to decide whether to continue, modify, or stop an experiment. If your main question is "Did my reaction work?," the High Performer delivers the answer quickly and efficiently.

### TripleXpert

for Advanced Analytical Flexibility:

#### **<sup>1</sup>H/<sup>13</sup>C/<sup>19</sup>F (H/C/F) system**

The TripleXpert configuration expands analytical capabilities with fluorine detection, making it ideal for chemists working with fluorinated compounds. It is well suited for more advanced structure verification, reaction monitoring, and impurity analysis where heteronuclei play a key role. TripleXpert supports confident decision-making in research environments that require greater molecular insight beyond routine proton and carbon analysis.

# Key Instrument Features and Technical Advantages



## Magnet & Probes

- Cryogen free permanent magnet for stable, everyday use
- Available configurations: Workhorse, Multi-Talent, High Performer, TripleXpert
- Optimized X channel sensitivity ( $^{19}\text{F}$ ,  $^{31}\text{P}$ ,  $^{29}\text{Si}$  - for the Multi-Talent)



## Digital Lock

- External lock - no deuterated solvent required



## Automation

- PAL RSI sample changer supporting 108 samples (incl. 12 reference samples), with option to extend to 252 samples in total
- Enables fully unattended overnight/week end sequences
- Controlled directly in GoScan or TopSpin



## Adjustable Temperature (AT)

- 25–60 °C controlled in GoScan™ or TopSpin
- Compatible with automated workflows
- Elevate your sample temperature without compromising performance



## Pulsed Field Gradient (PFG)

- Robust solvent/water suppression, DOSY, and 2D NMR with efficient, artifact free performance
- Gradient strength  $\geq 0.25 \text{ T/m}$



# Software



- Industry standard NMR software for routine and advanced acquisition and processing including multidimensional experiments
- Smart acquisition workflows and broad experiment libraries, from standard 1D/2D to sophisticated sequences (e.g., NOAH, NUS)
- Supports GxP aligned data integrity principles with secure user management options.
- Free academic processing version available, enabling widespread training and data analysis across institutions



## Advanced Chemical Profiling (ACP)

- Fully automated, scalable, and operator-independent workflow
- Precise analysis even in challenging samples with overlaps or macromolecular background
- Pass/fail assessments for critical control points in chemical production
- Sharing of analytical methods across teams and sites, driving global harmonization and collaboration
- Powerful analytical capabilities and intuitive interface, for a quick set up of sophisticated NMR workflows



## GxP Readiness

- Optional GxP Readiness Kits supporting compliance with 21 CFR Part 11 and EU-GMP Annex 11
- Includes GxP-ready software, IQ/OQ protocols and installation and qualification by qualified engineers



## GoScan

- Simple, intuitive a push-button interface guiding users through dedicated workflows
- Enables high quality data acquisition within minutes, ideal for non-experts and educational use
- Supports pre-defined or customized experiments
- Processed spectrum is always saved in TopSpin for further processing
- Mnova is optional
- Automation-ready interface showing experiment status at a glance; supports over night and weekend sequences with a sample changer



## InsightMR

- Combined hardware and software solution enabling real-time, in-line monitoring of chemical reactions under actual process conditions
- Enables on-the-fly adjustment of experimental parameters based on kinetic data
- Supports multi-nuclear 1D experiments with automated export for kinetic analysis



## synTQ

- Designed to integrate with LIMS, MES, and instrument orchestration platforms in GxP environments
- Supports standardized data workflows, traceability, and secure result transfer across manufacturing systems
- Facilitates seamless deployment of NMR data within regulated manufacturing and QC infrastructure

# Applications



## Education

Universities and teaching laboratories benefit from providing students with real, hands on access to NMR. The Fourier 80 is designed to be installed directly in the teaching lab without needing special infrastructure, letting students learn fundamental NMR concepts with easy to use workflows. With GoScan for guided operation and free access to TopSpin, students gain a genuine understanding of NMR spectroscopy and expert level software from day one.

- Bring hands on NMR training into the teaching lab
- Supports chemistry, environmental science, chemical engineering, biology, and more
- Includes the full TopSpin library with all HighField workflows available for learning
- Compatible with Bruker EduLabs for standardized teaching content

Bruker supports the Magnetic Resonance community with structured teaching tools, including EduLab Protocols, Education Kits, and the Educate2Resonate online platform. These initiatives enable students to build hands-on NMR experience using guided workflows and practical examples. They complement benchtop NMR teaching by offering ready-to-use protocols, interactive learning tools, and a global community for modern NMR education.





## Chemical Science

Chemists performing synthesis verification, structure confirmation, or reaction optimization can work directly at the bench or under the fume hood. The Fourier 80 provides rapid, reliable insight into educts, intermediates, products, and side products, enabling close-to-real-time feedback during experimental work. By minimizing sample handling and delays, it supports faster, better-informed decisions throughout the workflow. Automated interpretation tools and seamless integration into routine lab environments make it ideal for both academic and industrial chemistry.

- Verify synthesis steps directly at the bench or in the fume hood
- Monitor reaction progress, intermediates, and side products
- Access automated spectral interpretation with minimal effort
- Ideal for industrial R&D and academic research workflows



## Forensic Science

Forensic laboratories rely on fast, consistent, and unambiguous data when dealing with suspicious or disguised substances. The Fourier 80 provides structural and quantitative information that helps analysts to identify materials and quantify constituents with confidence. It also supports efficient mixture analysis and enables laboratories to organize spectra into searchable databases for long term casework support.

- Identify and quantify unknown or disguised substances quickly
- Analyze mixtures, and small organic compounds
- Build searchable spectral databases for cross case support





## Pharmaceutical Science

Pharmaceutical development requires precise control of reactions, consistent structure verification, and workflows that scale smoothly from early discovery to later development stages. With its reaction monitoring capabilities (RxnLite/RxnLab), pulsed field gradient performance, and compatibility with controlled temperature studies, the Fourier 80 supports formulation analysis, reaction understanding, and method development with trustworthy NMR data.

- Supports reaction monitoring (RxnLite/RxnLab)
- Provides structural confirmation for development processes
- Suitable for method development and scalable workflows
- On-the-fly optimized solvent suppression for direct solution and formulation studies



## Quality Control (QC)

Modern QC environments need fast, reproducible results to verify identity, purity, and stability of materials. The Fourier 80 fits seamlessly into QC workflows thanks to its straightforward operation, consistent performance, and support for regulatory-compliance. Combined with automation options it enables robust, sample-to-report hands-off analysis. It supports raw material checks, formulation assessment, and batch release testing with workflows that are easy to implement and maintain.

- Batch verification and routine checks for chemical identity and purity
- Stability control, raw material verification, and formulation assessment
- Reliable, reproducible data with easy to follow workflows
- Can be integrated with automated sequences for robust QC



## Technical Data

|                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Operating Frequency</b>                                          | 80 MHz ( <sup>1</sup> H) (Corresponds to 1.88 Tesla)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Nuclei Selection</b>                                             | <p><b>The High Performer:</b><br/> <sup>1</sup>H-only system with <sup>1</sup>H sensitivity of ≥ 240:1 or ≥ 220:1 when pulsed field gradient (PFG) incl. (1% ethyl benzene)</p> <p><b>The Workhorse:</b><br/> <sup>1</sup>H/<sup>13</sup>C system with <sup>1</sup>H sensitivity of ≥ 180:1 or ≥ 160:1 when PFG incl. (1% ethyl benzene)</p> <p><b>The TripleXpert:</b><br/> <sup>1</sup>H/<sup>13</sup>C/<sup>19</sup>F system with sensitivity optimized for the X-channel, PFG incl.; sensitivity:</p> <ul style="list-style-type: none"> <li>■ <sup>1</sup>H: ≥ 110:1 (1% ethyl benzene)</li> <li>■ <sup>19</sup>F: ≥ 110:1 (0.5% TFT in CDCl<sub>3</sub>)</li> </ul> <p><b>The Multi-Talent:</b><br/> <sup>1</sup>H/X system with X being any of the 15 software-selectable X-nuclei (<sup>2</sup>H, <sup>7</sup>Li, <sup>11</sup>B, <sup>13</sup>C, <sup>15</sup>N, <sup>19</sup>F, <sup>23</sup>Na, <sup>27</sup>Al, <sup>29</sup>Si, <sup>31</sup>P, <sup>51</sup>V, <sup>77</sup>Se, <sup>79</sup>Br, <sup>119</sup>Sn, <sup>129</sup>Xe), and sensitivity optimized for X-channel, PFG incl.; sensitivity:</p> <ul style="list-style-type: none"> <li>■ <sup>1</sup>H: ≥ 100:1 (1% ethyl benzene)</li> <li>■ <sup>19</sup>F: ≥ 90:1 (0.5% TFT in CDCl<sub>3</sub>)</li> <li>■ <sup>31</sup>P: ≥ 130:1 (0.485M TPP in Acetone-d<sub>6</sub>)</li> <li>■ <sup>29</sup>Si: ≥ 25:1 (100% HMDSO)</li> </ul> |
| <b>Gradient Strength</b>                                            | ≥ 0.25 T/m (25 G/cm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Adjustable Temperature:</b>                                      | 25°C – 60°C*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Automation</b>                                                   | <p>PAL RSI sample changer supporting 108 samples (incl. 12 reference samples), with option to extent to 252 samples in total.</p> <p>In addition there are new options for sample heating, cooling and barcode reader.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b><sup>1</sup>H Resolution<br/>(@ 50/0.55/0.11% Signal Height)</b> | <p>Standard: ≤ 0.4/15/30 Hz</p> <p>HD-Option: ≤ 0.3/10/15 Hz</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Digital Lock</b>                                                 | External, no deuterated solvents needed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Sample Tubes</b>                                                 | Standard 5mm diameter, 7"-long NMR tubes; compatible with J Young tubes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Dimensions</b>                                                   | ~50 cm × 70 cm × 60 cm (Height × Width × Depth)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Weight</b>                                                       | ~94 kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Lab Temperature</b>                                              | 18–28°C; measurements at sample temperature > 40°C: 18–25°C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Lab Infrastructure Needed</b>                                    | <ul style="list-style-type: none"> <li>■ No liquid nitrogen or helium required</li> <li>■ No water cooling required</li> <li>■ Power consumption typically &lt;300 W</li> <li>■ Power: 100 – 240 V, 50 – 60 Hz</li> <li>■ No additional venting required</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

\*AT needs compressed air or nitrogen at 5 bar max. Incoming supply gas temperature must be min. 5°C lower than the target temperature



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