



AvanceCore

- High resolution, streamlined.
More affordable than ever.

The AvanceCore offers high-resolution NMR with an impressive price/performance ratio, making NMR more accessible than ever before.

The AvanceCore combines Bruker's extensive NMR expertise and streamlined production processes to create a cost-effective product. The AvanceCore is designed for NMR users who value resource efficiency over everything else.

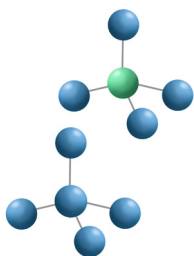
- The AvanceCore is available in three configurations.
- Features can be flexibly enabled and disabled with software subscriptions.
- You only pay for what you need, when you need it.

"A standard liquid chromatography mass spec instrument costs \$150,000 to \$200,000. The AvanceCore solution offers NMR at a similar price point."



● Time to Get an NMR

NMR is an extremely powerful analytical method. In combination with the affordability of the AvanceCore, this makes NMR the ideal tool to address a large range of analytical questions.



Structure Elucidation, Verification and Molecular Interaction

- Examine functional groups and how atoms are connected within a molecule.
 - Study molecules at atomic resolution
- Uncover molecular interactions at the atomic level, for example:
 - Substrate catalyst interaction
 - Aggregation, micelle formation and emulsification
 - Discrimination of monomers and polymers

Never Miss a Signal Again

- With NMR, what you see is what is present.

Chromatographic analysis requires process steps such as liquid injection or sample evaporation. Potential sample degradation or unwanted reactions complicate the assignment of signals.

- NMR selectively detects nuclei such as ^1H , ^{13}C , ^{19}F and ^{31}P which are present in organic molecules.

This is not apparent with other analytical techniques. For example, UV detectors for chromatography miss many substances without a chromophore. IR and mass detectors have similar limitations.



Quantitation



- NMR obtains structural and quantitative information simultaneously.

This instills confidence that the right signal is used for quantitation.
- With NMR, substances can be identified and quantified against any reference standard.

Other analytical methods rely on a reference standard of the same material.
- Several compounds, e.g. starting material, by-products, reagents and residual solvents can be quantified from a single NMR measurement against a single internal or external reference standard.

Other techniques such as HPLC, GC and MS require several sample preparations and measurements for quantitation.

Save Time and Money with NMR

- HPLC can deliver good separation and signal-to-noise — provided that the method was optimized for the particular application.

Different columns and methods might be needed for one sample.
- In contrast, 1D NMR experiments can be run with standard parameters for most samples. Several compounds are identified and quantified from a single spectrum, saving time and money.



● Three AvanceCore Configurations


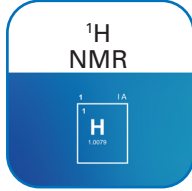


In order to keep costs low, Bruker has streamlined the AvanceCore into three pre-configured packages.

Foundation: In the most fundamental version, the AvanceCore provides high-resolution ^1H NMR spectroscopy. The bundle includes a 400 MHz NMR magnet, a console and a 5 mm probe.

Select: The AvanceCore Select includes all the hardware and software for ^1H and heteronuclear (^{13}C , ^{31}P ...) state-of-the-art experiments. The software subscription for the first year of broad-band operation is included.

Convenience: The AvanceCore Convenience includes a 24-position sample changer. The IconNMR software enables open access use and automated routine measurements. The IconNMR subscription for the first year is included.

Your instrument can grow with your needs: An existing AvanceCore can easily be upgraded from Foundation to Select and from Select to Convenience.

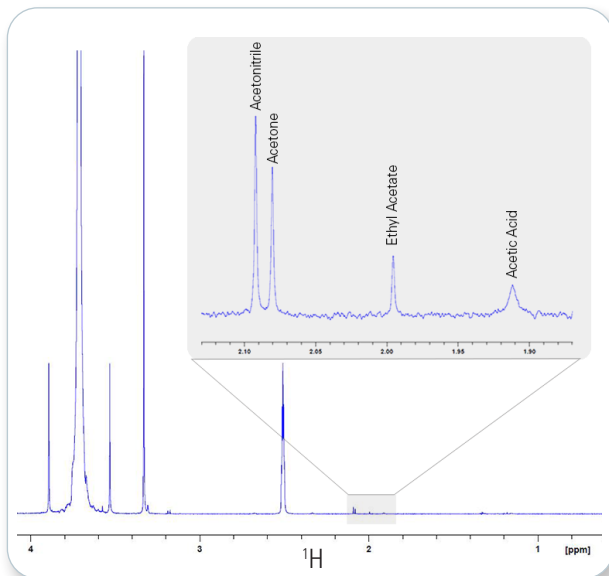
		Foundation	Select	Convenience
				
Hardware	400 MHz NMR magnet ¹	✓	✓	✓
	AvanceCore console	✓	✓	✓
	RT shim system	✓	✓	✓
	5 mm NMR probe ²	✓	✓	✓
	Windows workstation (incl. screen)		✓	✓
	Sample cooling unit ³		✓	✓
	Vibration isolators		✓	✓
	Sample changer with 24-positions			✓
	Nitrogen level gauge and heat exchanger			✓
	Installation included ⁴	✓	✓	✓
Yearly Subscription	TopSpin Foundation for AvanceCore ⁵	✓	✓	✓
	TopSpin Method Development for AvanceCore ⁵	✓	✓	✓
	Broadband subscription ⁵		✓	✓
	IconNMR ⁵	✓	✓	✓
	GoScan ⁵	✓	✓	✓
	TopSpin for data processing and evaluation AutoCalibrate	(Opt.) ✓	(Opt.) ✓	(Opt.) ✓
Service	LabScape Essential LabScape Complete	(Opt.) ✓	(Opt.) ✓	(Opt.) ✓
	Remote monitoring	✓	✓	✓

¹Foundation, Convenience and Select are also available as a console and probe replacement if a 400 MHz NMR magnet is already in place. The mechanical interfaces of the AvanceCore magnet are compatible with the Avance NEO hardware. Future upgrades to a full Avance NEO are thus possible by exchanging the console and the probe.

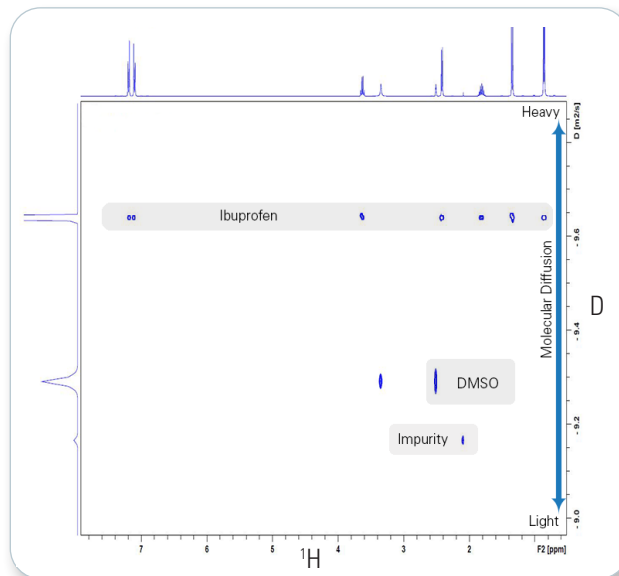
²The AvanceCore probe supports automatic tuning and matching and is ready for broadband capability depending on the "Broadband subscription". ³Regulated temperature between 0° C and room temperature. Increases temperature stability. ⁴Including installation, excluding cryogenics. ⁵One-year subscription included. A renewal plan is available that can be canceled without notice.

● Example Spectra

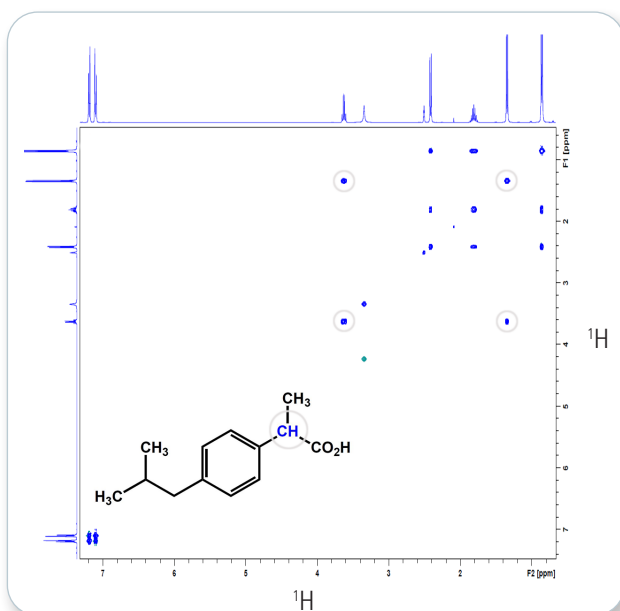
The AvanceCore is highly cost effective and facilitates uncompromized performance in high-resolution NMR. Outstanding dispersion and signal-to-noise ratio enable mixture analysis down to ppm concentrations. The AvanceCore supports state-of-the-art 2D NMR methods to elucidate molecular structure at the atomic level.



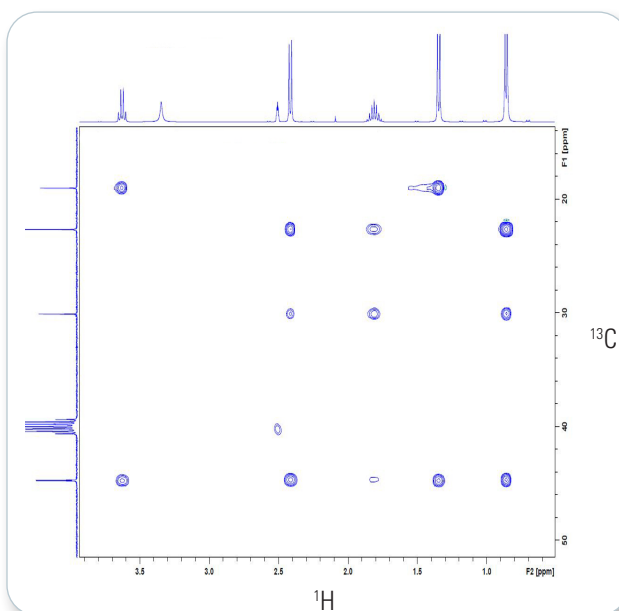
Identification and quantitation: The above ^1H spectrum was acquired with the AvanceCore Foundation from a 20 mg sample in less than 5 minutes. The sample contains 100 ppm (0.002 mg) of the following impurities: acetonitrile, acetone, ethyl acetate and acetic acid in DMSO-d_6 .



With the AvanceCore Foundation, the ^1H DOSY NMR experiment for mixture analysis can be performed. DOSY is often referred to as "chromatographic NMR". Just like LC-MS, it resolves the different mass and diffusion properties of individual mixture components.



The AvanceCore Foundation also supports state-of-the-art ^1H - ^1H 2D experiments such as TOCSY, COSY, ROESY and NOESY. The above spectrum shows TOCSY-correlations of the anti-inflammatory drug Ibuprofen. The TOCSY can be used for structure assignment.

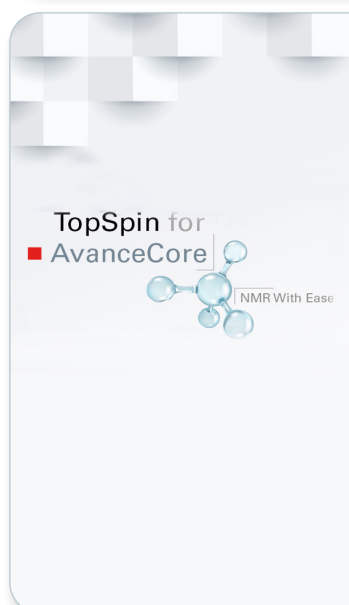


The AvanceCore Select supports heteronuclear experiments (HSQC, HMBC...) which are essential for molecular structure elucidation. The above spectrum shows a 2D $^1\text{H}/^{13}\text{C}$ HSQC-TOCSY experiment recorded from a 20 mg Ibuprofen sample.

● TopSpin Subscriptions

Software enables powerful features on the AvanceCore. With our yearly subscription model, you only pay for what you need, when you need it. This makes your AvanceCore NMR spectrometer more affordable than ever before. The AvanceCore software blends perfectly into the existing Bruker ecosystem utilizing the same pulse programs and parameter sets.

Whether you are in industry or academia, software packages and payment plans can be configured to suit your individual lab's needs, depending on your analytical requirements and your funding schedule.



TopSpin for AvanceCore

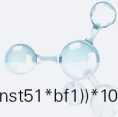
A streamlined software for the acquisition and processing of NMR data.

- Fixed lock solvents: acetone-d₆, benzene-d₆, acetonitrile-d₃, methanol-d₄, CDCl₃, D₂O, 9:1 H₂O:D₂O, DMSO-d₆
- Fixed pulse programs (Foundation): 1D ¹H, 1D pre-saturation, 1D decoupled, COSY, TOCSY, NOESY, ROESY, DOSY
- Fixed pulse programs (Select and Convenience): 1D ¹H, 1D pre-saturation, 1D decoupled, COSY, TOCSY, NOESY, ROESY, DOSY, HSQC, HMBC, HSQC-TOCSY, INADEQUATE
- Pulse programming, AU and Python programming not supported
- Command and experiment queue (spooler) not supported
- Auto lock/shim. Manually accessible shims: Z, Z2, Z3, X, Y, XZ, YZ
- Updates to the current release version are mandatory throughout the product lifecycle. An internet connection is necessary.
- The following applications are not supported: CMC-Assist, SmartDrive NMR, AssureSST, NUS, nmrsim, 2D/3D structure drawing/viewing, simulation of 1D spectra, identification of ¹³C spectra with CSEARCH, Amix viewer and fragment based screening.
- Only Microsoft Windows supported

TopSpin Method Development for AvanceCore

Bruker's industry standard TopSpin for acquisition and method development with the AvanceCore.

- All lock solvents
- All Bruker pulse programs
- Pulse programming, AU and Python programming supported
- Command and experiment queue (spooler) included
- Auto lock/shim. All shims manually accessible
- Updates to the current release version are mandatory throughout the product lifecycle. An internet connection is necessary for updates

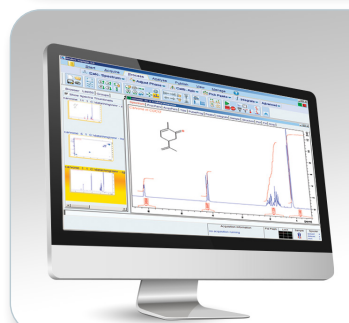


```
# ifdef CALC_SP
*p41=(bwfac25/(cnst55*cnst51*bf1))*1000000"

*spual25=1"
*spual27=0"

*p42=(bwfac26/(cnst55*cnst52*bf1))*1000000"
*spw26=plw1/((p42*90.0)/(p1*totrot26))*((p42*90.0)
*spual26=0.5"

*spw28=plw1/((p43*90.0)/(p1*totrot28))*((p43*90.0)
...
```



TopSpin for Data Processing and Evaluation

Additional TopSpin subscriptions are available for data processing away from the spectrometer.

- Yearly subscription
- Can be easily moved between client PCs
- Can be used as a pool-license on a server
- Expert solution for data processing away from the spectrometer
- NMR data can be accessed by a folder tree or by drag and drop from the Windows explorer

● Additional Software Subscriptions



Broadband Subscription

In combination with the Select hardware package, the broadband subscription enables the following:

- Broadband channel: ^{19}F and ^{31}P - ^{109}Ag without ^{171}Yb to ^9Be
- Experiments with hetero nuclei such as ^{13}C , ^{31}P , etc.
- Heteronuclear 2D correlation experiments such as HSQC, HMBC etc.

IconNMR

In combination with the Convenience hardware package, IconNMR enables open access NMR (non-expert mode) for automated and routine measurements.

- Controls the 24-position sample changer
- Turns the system into an open access platform by providing an intuitive user interface for the easy setup of NMR measurements
- Provides automation and routine functionality for the measurement of multiple samples



GoScan

GoScan for AvanceCore facilitates easy and intuitive, push-button acquisition of NMR spectra combined with automated data processing.

- Straightforward entry-level software for the acquisition of NMR spectra
- Push-button operation of the AvanceCore NMR spectrometer
- Facilitates open access capabilities
- Controls the sample changer (if available)
- Based on industry-standard TopSpin. Parameter sets and pulse programs are compatible.

AutoCalibrate

AutoCalibrate facilitates the evaluation and calibration of the most important NMR system parameters.

- Optimizes the 3-dimensional shim
- Monitors the pulse length
- Generates a pdf report with the most important calibration results
- With an AvanceCore Convenience, AutoCalibrate runs can be started at pre-set times during the night



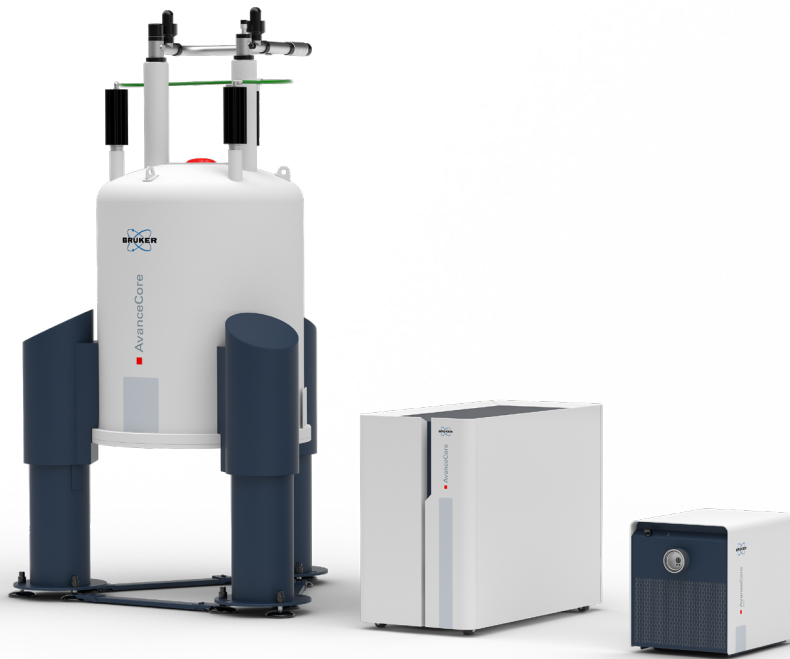
Mnova

Mnova NMR is a professional software product to visualize, process, analyze and report 1D and 2D NMR data. It supports the specific NMR needs of analytical and organic chemists. The AvanceCore includes trial licenses for Mnova NMR, NMRPredict Desktop, Verify and qNMR.

- Modern & intuitive ribbon control GUI with minimal learning curve
- Report to journal/patent made easy and fast
- Scripting capabilities to increase productivity by automating tasks
- Manual and automatic assignment to provide results to novice and help to advanced users
- Automated structure verification for structure identity confirmation with Mnova Verify

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Bruker **Biospin**

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bruker.com