Bruker BioSpin

MATCH™

Multiple Adjustable Tube Clamp Holder

User Manual - Version 005

think forward

NMR Solutions

The information in this manual may be altered without notice.

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Contents

Contents

Introduction 1

The Bruker BioSpin **M**ultiple **A**djustable **T**ube **C**lamp **H**older (MATCH^{TM}) system provides you with an easy and cost-efficient means to optimize the signal-to-noise ration of each of your samples. By matching the NMR tube diameter to the size of your sample, you will be able to place most of your sample in the active volume of your NMR coil. This leads to an enhanced signal detection compared to diluting the same sample quantity in a larger tube.

The Bruker MATCH system allows you to choose from a variety of tube diameters, ranging from 1.0 to 5.0 mm, thus allowing you to tailor your experiment to the amount of sample available.

The MATCH allows you to do this with a single tool and short tubes, i.e. no need to acquire multiple spinner sizes, nor to buy expensive NMR tubes of different diameters.

In addition to its use for small sample quantities, the MATCH system can be used to counteract the losses in sensitivity of salty samples. In such samples the limits RF penetration can be counteracted by choosing a smaller diameter.

Disclaimer 1.1

The MATCH system should only be used for its intended purpose as described in this manual. Use of the unit for any purpose other than that for which it is intended is taken only at the users own risk and invalidates any and all manufacturer warranties.

Read this manual before using the MATCH. Pay particular attention to any safety related information.

The MATCH^{TM} device is protected:

US Patent US 6,741,079 B2

UK Patent GB 2381316

German Patent DE 101 30 283 C1

Safety Issues 1.2

The MATCH system allows convenient and safe handling of samples within a laboratory environment if standard laboratory operating procedures and established laboratory practices are followed. Be sure to review all established policies and procedures for your laboratory before using the MATCH system.

Warnings and Notes 1.3

There are two types of information notices used in this manual. These notices highlight important information or warn the user of a potentially dangerous situation. The following notices will have the same level of importance throughout this manual.

Note: Indicates important information or helpful hints

WARNING: Indicates the possibility of severe personal injury, loss of life or equipment damage if the instructions are not followed.

Contact for Additional Technical Assistance 1.4

For further technical assistance on the BPSU36-2 unit, please do not hesitate to contact your nearest BRUKER dealer or contact us directly at:

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System Characteristics 2

Characteristics of the MATCH System 2.1

This chapter lists some of the important characteristics of ***"The MATCH System"***:

- The MATCH device is a holder for 100 mm long NMR sample tubes with diameters ranging from micro tubes up to 5 mm NMR tubes (see ***"Ordering Information" on page 13***).
- The MATCH device fits into a standard 10 mm BRUKER spinner.
- The MATCH insert for the 10 mm Bruker spinner is suited for all **non-spinning** applications.
- The handling of 100 mm NMR tubes is far easier than standard 7” (180 mm) long tubes. e.g. long pipettes are not required to fill the sample tube.
- The insert can be precisely adjusted to an insertion depth of 9 - 21 mm. After initial adjustment the tubes are automatically set to this depth.
- One spinner and holder can be used for a wide variety of NMR tube sizes. The holder is fitted with an easily exchangeable clamp that is adapted to the diameter of the sample tube.
- The clamps are color coded according to NMR tube diameter (see ***"Ordering Information" on page 13***).
- NMR tubes can be easily exchanged while the MATCH device is still mounted in the NMR spinner. Depressing the top of the MATCH device will release the tube.
- The length of the NMR sample tube can be adjusted and smaller tube sizes can be used. This set up is especially useful for optimizing samples of limited volume.
- MATCH clamps have a chemically inert seal to minimize the evaporation of solvent.

Figure 2.1. The MATCH System

Preparation & Handling

3

This chapter discusses the proper way to prepare and mount the MATCH insert assembly clamp, information on sample handling, and the proper method of inserting and remove the NMR tube.

Preparing and Mounting the Clamp *3.1*

Figure 3.1. The MATCH Insert Assembly

- Insert the holder into a 10 mm NMR spinner.
- Position the clamp so that it is flush with the lower end of the 10 mm spinner. The adjustment screw may be used to extend the length of the device if necessary.
- To exchange clamps, press the tip to release the currently mounted clamp. Hold the tip and unscrew the clamp. Keep the tip depressed and mount the new clamp. Screw the new clamp in until you feel resistance (finger tight). Release the tip and the MATCH device is ready to introduce into a 10 mm NMR spinner.

Sample Handling 3.2

- Use only high quality NMR tubes (see ***"Ordering Information" on page 13***).
- Fill the sample into the sample tube. Syringes and needles for convenient filling are available (see ***"Ordering Information" on page 13***).
- Clean the top rim of the sample tube to prevent contamination of the seal inside the holder.

Inspect the top rim of the tube for damage. A damaged tube could lead to problems with insertion, positioning and sealing of the sample tube.

Inserting the Sample Tube 3.3

- Hold the NMR spinner with the tube holder already in place in one hand and press the tip of the holder to open the clamp at the bottom.
- The NMR tube is very fragile. Hold the tube near the top to prevent breakage.
- Insert the sample tube completely (approx. 20 mm) into the holder.
- Release the top of the holder and check that the tube is completely inserted.
- If the tube not fit tight, a soft pull at the top will help to seat the tube properly.

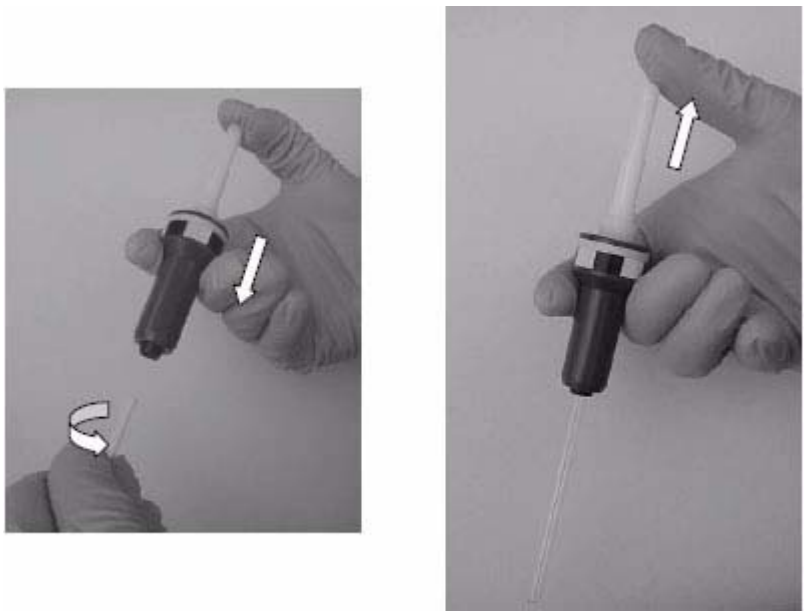

Figure 3.2. Inserting the Sample Tube

- Insert the sample and spinner assembly into the depth gauge. Adjust the tube to the proper vertical position with the MATCH adjustment screw. The correct vertical position will depend on the type of NMR probe to be used.
- **Warning**: Do not change the vertical position of the NMR tube! Instead change the vertical position of the *holder* in the spinner.
- The MATCH insert assembly is made out of the same material as the 10 mm spinner and it is recommended not be used with temperatures above 50°C

Warning!

Be careful when inserting the tube. Rotate it slightly as you insert it into the clamp.

Avoid bending the tube and do not force the tube into the clamp. The tube should slide in without resistance.

Do not use tubes with broken rims as this may damage the clamp. In general, tubes with smaller diameters are more fragile.

Handle them with care.

Use only high quality NMR tubes.

To avoid contamination of the tube and spinner, wear gloves, or use a soft, lint free cloth to hold the sample tube.

Removing an NMR Tube *3.4*

- To release the NMR tube, press the tip of the MATCH device and pull the tube straight out of the clamp.

General Handling Instructions *3.5*

- You must insert the sample tube ***completely*** into the holder so that the open top of the sample tube is pressed against the ***seal*** inside the holder.
- You must insert the sample tube ***completely*** into the holder for best reproducibility of the ***vertical positioning*** of the sample tube. If this is not done, it is necessary to check the positioning manually with the sample depth gauge for each sample.
- Use only ***high quality sample tubes***. Such tubes are manufactured to tight specifications and each tube will have a well defined outer diameter (OD) and length. This ensures that they will fit always perfectly in the clamp and maintain

the correct vertical position. High quality tubes also have a smooth top rim that will make tube insertion easier as well as prevent scratches inside the clamps.

Ordering Information & Accessories

4

Ordering Information 4.1

Table 4.1. Ordering Information

Tube ID	Clamp Color Code	Sample Volume for Filling Height		Bruker Order Number		
		35 mm	40 mm	MATCH Insert	Spare Clamps	NMR Tubes 100 mm
(mm)		*(µl)*		*1 piece/pack*	*1 piece/pack*	*10 pieces/pack*
1.0**	**black**	12	14	AH1130 Var. 10	AH1140 Var. 10	AH1160 Var. 10
1.7**	white	45	50	AH1130 Var. 17	AH1140 Var. 17	AH1160 Var. 17
2.0	**yellow**	70	80	AH1130 Var. 20	AH1140 Var. 20	AH1160 Var. 20
2.5	**red**	120	140	AH1130 Var. 25	AH1140 Var. 25	AH1160 Var. 25
3.0	**green**	160	190	AH1130 Var. 30	AH1140 Var. 30	AH1160 Var. 30
4.0	**blue**	310	360	AH1130 Var. 40	AH1140 Var. 40	AH1160 Var. 40
4.25	white	370	430	AH1130 Var. 42	AH1140 Var. 42	AH1160 Var. 42
5.0	**black**	490	560	AH1130 Var. 50	AH1140 Var. 50	AH1160 Var. 50

** Not suited for dedicated “Shuttle NMR“ probes!

Accessories 4.2

Table 4.2. List of Accessories

Part Number	Description
Z5293	10 mm Spinner POM
AH1150	100x Disposable Syringe and 100x Needles (suited for 2.0 to 5.0 mm tubes)
88070	Disposable Glass Syringe with Reservoir (suited for 1.0 to 4.0 mm tubes)
H1381	Barcode Socket for MATCH

Product Availability 4.3

Currently the recommended NMR tubes are available from:

Table 4.3. Product Availability

Company	Contact Information
Bruker Biospin	Contact your local sales office.
Hilgenberg GmbH	www.hilgenberg-gmbh.de
Norell Inc.	www.nmrtubes.com

Notes:

Bruker BioSpin
your solution partner

Bruker BioSpin provides a world class, market-leading range of analysis solutions for your life and materials science needs

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