



As an alternative to the spin finish analyzer ALFA 500, Lenzing Instruments offers also the **ALFA NMR**, which is based on the technique of Time Domain NMR (Nuclear Magnetic Resonance)

As well as ALFA 500, **ALFA NMR** offers spin finish determination based on modern analytical technology, featuring fast, accurate, non-destructive and solvent-free analysis. The operation is user-friendly and the measurement can be performed by plant operators close to the production line.

Additionally to determining the content of spin finish and additives, ALFA NMR is also applied for analysis of the amount of elastomer coatings, so-called DIPs on fibers.

The TD-NMR methodology allows for multifilament, monofilament, texturized yarns and all kinds of spin finishes to be tested with **ALFA NMR**.

Either a weighless or a weighing testing method can be applied, depending on the individual needs of the customer.

Calibration of the **ALFA NMR** is simple and intuitive, using a Daily Check sample to check and guarantee the proper performance of the system. The validity of the calibration is controlled by using the Spin Finish Calibration Validation Samples.

The measurement itself is carried out by loading the sample into specially designed nonbreakable sample tubes which ensure fast and safe sample loading. By using these new and innovative spin finish sample tubes, systematic errors due to sample transfer are avoided. The analysis is automatically triggered by inserting the tube into the **ALFA NMR**. A few seconds later, the result is written into a concise data table.

ALFA NMR is manufactured by Bruker/Germany for Lenzing Instruments GmbH & Co. KG

Scope:

One-unit automatic instrument for determination of the spin finish concentration (% OPU, % FOY) on filament yarn by means of the TD-NMR method. It also enables measurements of the amount of elastomer coatings, i.e. DIPs on fibers.

Method:

The TD-NMR signal of a filament sample exhibits different components, each characterized by a typical decay behaviour. Whereas the filament shows a very rapid signal decay, moisture on the filament is characterized by an intermediate relaxation behaviour.

Well separated from both is the NMR signal of spin finish. Therefore, spin finish can be observed and quantitatively analyzed by the TD-NMR method.

The filament material is inserted in a special unbreakable spin finish sample tube with pre-marked stopper positions for fast and safe sample loading. Depending on the method applied, sample weighing might be required.

For calibration of the **ALFA NMR** and analysis of unknowns, the tube is inserted into the device and the TD NMR signal is detected. Finally the NMR data is used to calculate the result of an unknown or to create / adjust a calibration curve.

Results:

The results of the measurements are displayed through the userfriendly MS-Windows software.

Testing time:

Approx. 2 min per sample

Measuring range:

Full measurement range from 0.2 % to 5 % FOY, OPU

Accuracy:

Depends on the calibration. When using the weighing testing method, approx. 1 ‰

Repeatability:

< 1 %

Sample size:

Depends on the kind of filament and content of spin finish being tested: 1 - 5 g

Operating temperature:

Ideal: 22 - 25 °C
Min.: 18 °C
Max: 28 °C

Magnet temperature:

Fixed (40 °C nominal)

Humidity:

20 - 80 % relative, not condensing

Power supply:

230 / 115 VAC ± 10 %, 50 / 60 Hz, 180 W

Power consumption:

Regular operation: 40 W

NMR frequency:

20 MHz

Dimensions:

Height: 330 mm
Width: 470 mm
Depth: 600 mm
Weight: 80 kg

Software:

Requires Windows® with Office 2010

Delivery scope:

A one cabinet spectrometer including calibration validation and transfer samples as well as Spin Finish sample tubes. Software CD with instruction manual

Warning: ALFA NMR should not be used by persons carrying pacemaker

Technical data and pictures are subject to change!