ALFA NMR

LENZING INSTRUMENTS

As an alternative to the spin finish analyzer ALFA 300, Lenzing Instruments offers also the **ALFA NMR**, which is based on the technique of Time Domain NMR (Nuclear Magnetic Resonance)

As well as ALFA 300, **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.

The TD-NMR methodology allows almost all fibers and 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 in-tuitive, 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, which guarantee the precise and reproducable determination also of low spin finish concentrations.

The measurement itself is carried out by loading the sample into specially designed non-breakable 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.

If you want further automatization of the measurement procedure, there is the optional sample changer, into which more than 100 samples can be loaded. A barcode reader can be added to directly track samples. The results are automatically stored into databases and visualized in clearly arranged tables.

ALFA NMR

SPIN FINISH TESTER

Scope:

One-unit automatic instrument for determination of the spin finish concentration (OPU, FOY) on single staple fibers and monofilaments by means of the TD-NMR method.

Method:

The TD-NMR signal of a fiber sample exhibits different components, each characterized by a typical decay behaviour. Whereas the fiber shows a very rapid signal decay, moisture on the fiber 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 fiber 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 user-friendly MS-Windows software.

Testing time:
Approx. 2 min per sample

Measuring range:
Full measurement range from 0% to 100% FOY, OPU. Also suitable for a spin finish content of less than 0,1% FOY, OPU.

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

Repeatability:
Depends on the calibration. Example:
In testing PET monofilament fibers at a spin finish level of 0,076 wt%, the absolute standard deviation was found to be 0,00085 wt%.

Sample size:
Depends on the kind of fiber 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:
100 - 240 V / 50-60 Hz
180 W

Power consumption:
Regular operation: 40 W

Dimensions:

Height:	300 mm
Width:	470 mm
Depth:	600 mm
Weight:	80 kg

NMR frequency:
20 MHz

Noise level:
< 40 dB(A)

Software:
Requires Windows XP with Office 2007

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

Option:
Automatic sample changer, with a capacity of more than 100 samples. A barcode reader can be added to directly track samples.

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

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