



## Spin Finish Analysis by the Spin Track NMR Analyzer

### GENERAL NOTES

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Spin Finish or Oil Pick Up (OPU) measurements on artificial fibers are essential in textile industry. For a couple of recent decades, it is successfully being done by the Time Domain Nuclear Magnetic Resonance (TD-NMR) techniques. Apart from the former wet chemical extraction method, TD-NMR demonstrates high accuracy and repeatability along with the fastest possible results outcome. By using the Spin Track analyzer, the measurement takes no longer than one minute, it does not require any solvents or complicated sample preparation and there is no need in qualified personnel with chemical education. There are two options for a customer in selection of the measurement program:

**The weighting method** – very accurate values of the OPU with high repeatability. It can be used for the entire possible range of the Spin Finish content. The measurement assumes weighting of a sample with the following NMR measurement that starts automatically when a test tube is inserted into NMR magnet.

**The weightless method** – it is used far more often mostly due to rapid results readiness. For low OPU content the values are slightly less precise but for most of application the accuracy is sufficient.

### MEASUREMENT FLOW

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For both methods it is needed the Spin Track NMR analyzer together with the Spin Finish application, calibration samples and the balances for the weighting method are supplied by Resonance Systems.

Calibration procedure is not required to be performed every day, in most of the cases doing it once a month is enough.

Samples should be placed into standard 18 mm OD test tubes.

The measurement itself starts automatically with the sample placed into the Spin Track analyzer.

All results are stored into the database on the hard disk of PC or to the cloud data system that can be optionally presented by the Resonance Systems or taken from popular Microsoft OneDrive, Dropbox or any other network location.

### INSTRUMENTATION

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The [Spin Track NMR Analyzer](#) (Fig. 1.) is a benchtop device that requires just a laboratory table and power plug. It is driven by a personal computer operated under Microsoft Windows starting from Windows 7 up to Windows 10.

When it is powered on it takes not more than an hour or two (but actionally less) for it to get into the working state. It can be left powered on for indefinite period.

The easy everyday device validation routine is suggested but not normally required. It last for about 4 minutes before the instrument is proved for metrological actions.



Fig. 1. Spin Track NMR Analyzer



The software Relax 8 that controls the NMR device is fully consistent with modern graphical user interfaces. When Spin Finish application is loaded it just enough to put a sample into the measurement cell to get accurate results.

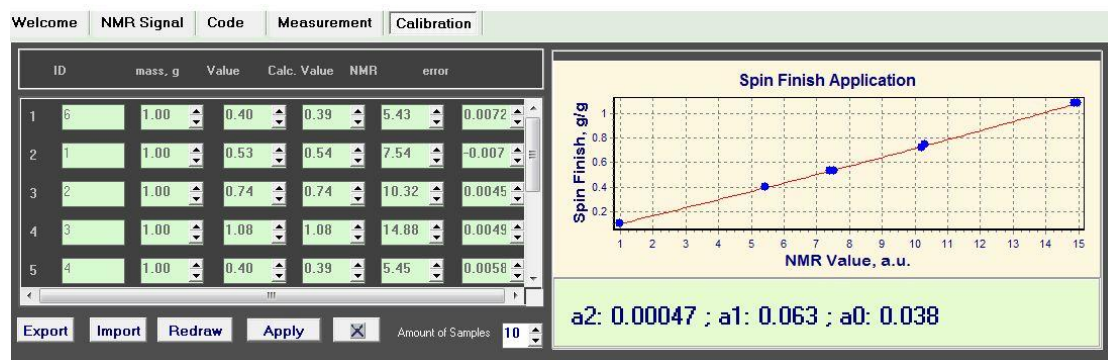


Fig. 2. Calibration interface for the OPU application

For better representation of the results several types of spreadsheets are supported.

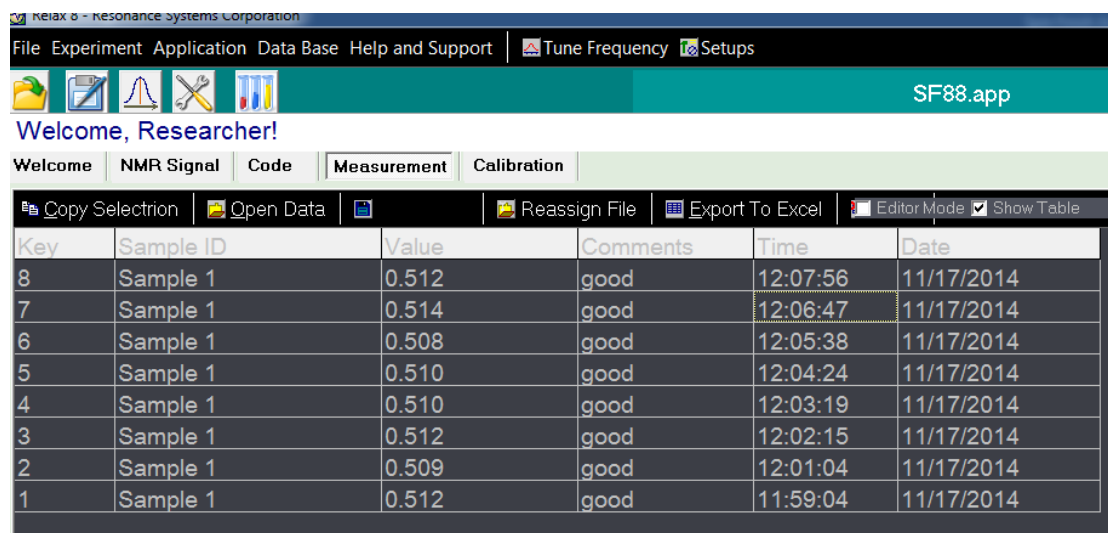


Fig. 3. Reproducibility of the Spin Finish values measured by the Spin Track

And one more important thing. The [Spin Track NMR Analyzer](#) is able to do many other tests and applications in Polymer, Food, Petroleum and other areas. So when a customer acquires it for a definite measurement type it can be supplied with many other techniques just loading special app files turning the complete system into powerful multifunctional laboratory.

Please refer to additional information on the web site of Resonance Systems [www.nmr-design.com](http://www.nmr-design.com)