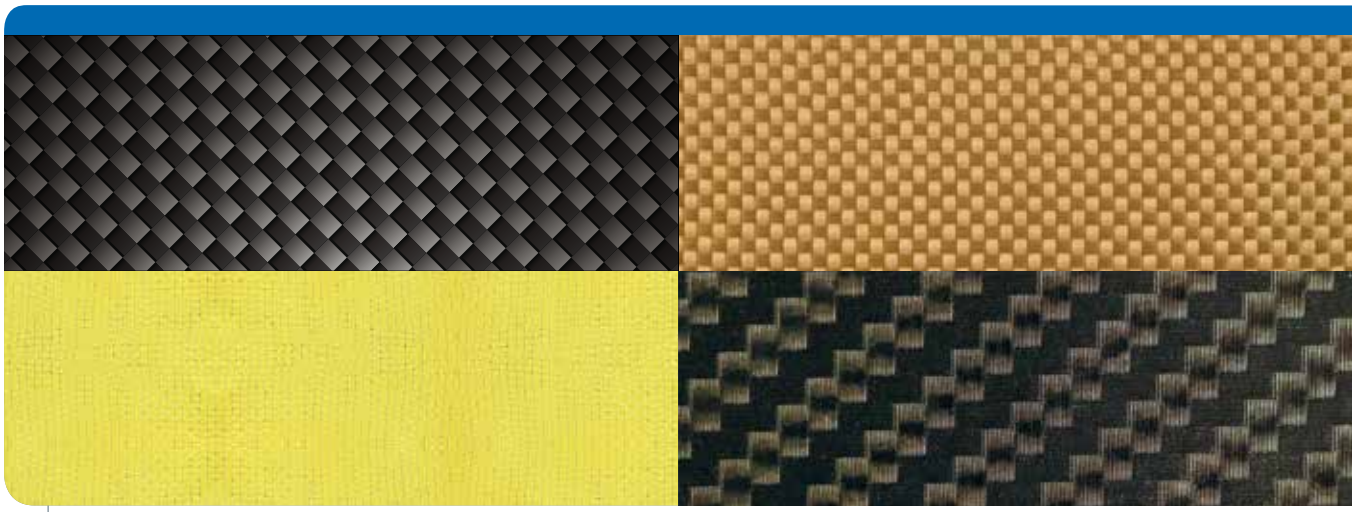


Textile Check for Spin Finish Removal

Fast and Reliable Quality Control | Application #13

For certain applications, it is important that the textiles are free of Spin Finish. Especially for bulletproof vests, Spin Finish has to be washed off completely. If Spin Finish is not fully removed, the bullet would slide through the vest despite the set-up of several overlaid textile layers. For other applications, Spin Finish has to be removed, too: for example, prior to surface functionalization for windproof or water repellent property.
The minispec is able to detect Spin Finish down to very low concentrations. Thus, it is the method of choice to monitor the washing of Spin Finish on fibers and control the absence of Spin Finish.

Features and Benefits

- Very few calibration samples necessary (3–5)
- Independent from sample color or surface
- No solvent required, minimum sample preparation
- Detection limit between 0.01 and 0.1 %, depending on the kind of fiber and Spin Finish
- Superior sensitivity compared to other analytic methods
- High reproducibility given, due to excellent magnet and magnet temperature stability

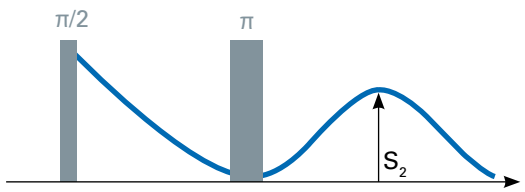
Applicable Material

- Technical, textile and high performance fibers
- Multifilaments, texturized samples
- Polyester, polyamide, polypropylene, polyethylene, polyacrylonitrile fibers

Application Method

The textile check for Spin Finish removal application is based on the observation of the magnitude of the Spin Finish signal. Similar to the standard Spin Finish determination, the Spin Finish concentration correlates with the weight-normalized amplitude of the Hahn echo (S_2) signal (given a suitable pulse separation between 90 and 180° pulses). The smaller the amplitude of the normalized signal is, the lower the Spin Finish concentration.

Measurement Procedure



S_2: Spin Finish (echo) signal

Note: This method requires the weighing of the fiber sample. Make sure to use dry fibers and not to exceed the specified filling height. The average sample mass depends upon the kind of textile, and the detection limit on the amount of textile measured.

Calibration

For calibration, 3 to 5 samples of well-known Spin Finish content are necessary. These reference values can be determined with alternative methods, such as Soxhlet. For the calibration, samples with very low concentration of Spin Finish are measured. Alternatively, calibration can also be performed by adding defined masses of Spin Finish to a fiber free of Spin Finish.

Workflow

Weigh empty sample tube	1 min
Fill sample tube	2 min
Weigh filled sample tube	1 min
Temper sample tube at 40 °C	*20 min – 30 min*
Run measurement	30 sec – 3 min
Results (report)	total time < 5 min*

*For sample tempering additional 20 – 30 min needed.

Recommended Equipment

- mq-one Spin Finish Analyzer for routine analysis *or* mq20 with 18 or 25 mm sample diameter for versatile use
- Multilingual m+ software with fully traceable data
- TEFLON® tubes
- Balance for sample weighing
- Metal block thermostat for sample pre-tempering (optional)

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