



Oil & Moisture Analysis in Seeds and Residues

- Fast and Reliable Quality Control and R&D Application #2

Since seeds are pressed to extract the oil, the price of seeds depends on their oil content and thereby farmers are paid accordingly. Therefore, oil mills and analytical laboratories evaluate large amounts of samples every day, especially during the harvest season. Moisture content is controlled to ensure good storage. Additionally moisture has to be carefully and accurately controlled before pressing because it influences the shelf life of the oil. At the same time, Bruker's minispec Seed Analyzers offer fast, accurate and non-destructive simultaneous determination of oil and moisture contents.

For seed breeding and crop selection, Bruker's minispec also allows for single seed analysis with excellent sensitivity.

Bulk analysis Time-Domain-Nuclear Magnetic Resonance methods for oil seeds and residues are recognized as International standard methods according to:

- ISO 10565
- ISO 10632 for Residues
- AOCS Ak 4-95
- USDA GIPSA Approved

Features and Benefits

- Very few calibration samples necessary (3 to 5)
- The whole sample volume is analyzed
- No sample grinding, sample preparation, or solvents required
- Non-invasive and non-destructive measurement
- Independent from sample color and surface
- Double to triple reproduction than wet chemistry and other competing methods

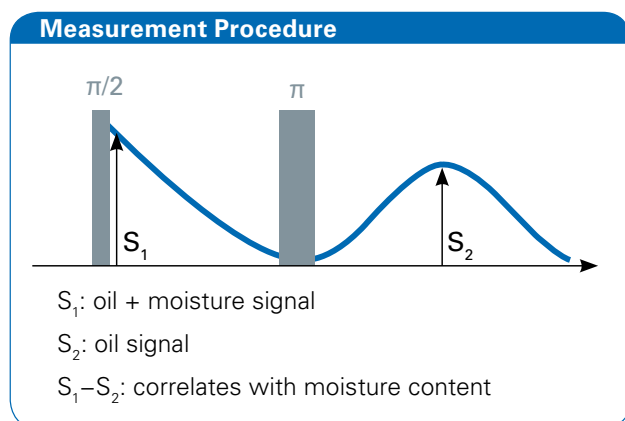
Range of Application

Bruker's minispec Seed Analyzers and the wide range of minispec configurations allow for measurement of various sample sizes from single seed to 100 ml.

- Oil seeds including canola, sunflower, flax, soy, hemp, corn, cotton, poppy, mustard
- Oil seed press cake and extraction residues
- Various seeds, beans and palm kernels

Application Method

Oil and moisture are each characterized by a typical decay behavior and their NMR signals can be quantitatively analyzed. Therefore, a Hahn echo pulse sequence is applied. The weight-normalized signal amplitudes (S_2 and $S_1 - S_2$) correlate with the oil and moisture contents respectively.



Calibration

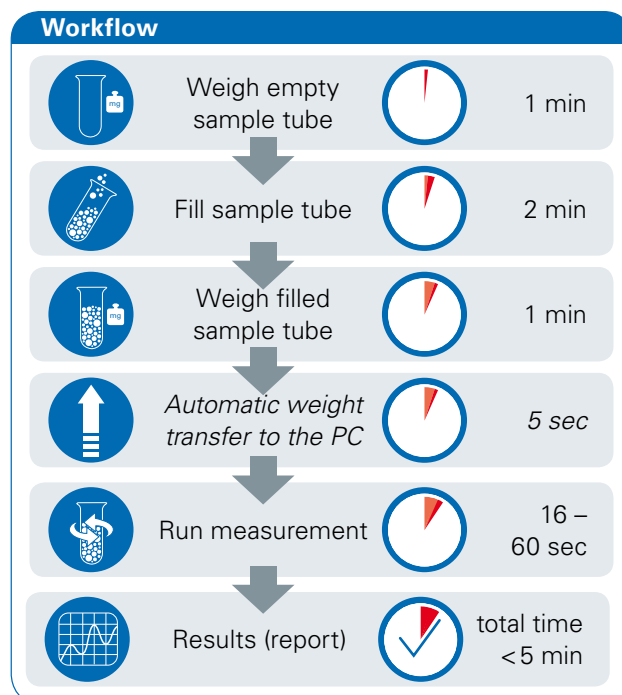
The system is calibrated with 3 to 5 samples of the respective seeds with known oil and moisture values. Alternatively, the oil content can also be calibrated with the respective oil. For rapeseeds standard samples supplied by IRMM (EU) are also available.

Bulk Screening

The Seed Analyzer and Seed Analyzer XL allow analyzing of a representative sample amount at once with their 40 mm sample tubes (40 ml sample volume), and 50 mm sample tubes (100 ml sample volume), respectively.

Seed Breeding Programs

18 mm and 10 mm sample tubes fit the mq20 and mq40 which allow for the analysis of small samples or of single seeds with excellent sensitivity.



Recommended Equipment

- minispec mq-one Seed Analyzer or Seed Analyzer XL for routine
- minispec mq7.5, mq10 or mq20 for R&D and routine
- minispec mq40 for R&D
- Multilingual m+ software with full data traceability
- Glass tubes
- Balance for sample weighing and automatic weight transfer to minispec software

