Oilseeds | **NMR Analysis of Oil and Moisture**

Summary

Oilseed and other oil-bearing crops are common throughout the world as important sources of energy and edible oils.

Once harvested, the seeds go through a crushing process to produce oils for a variety of uses. Crops include the oilseeds sunflower, rapeseed, canola, linseed, cotton, safflower and sesame—plus others like soya bean, copra, groundnut and palm. Oil content determines a crop's commercial value while the moisture content affects its storage characteristics. As a result, these parameters are of significant value to those in the entire value chain (crushers, processors and traders).

Pulsed Nuclear Magnetic Resonance (NMR) is a fast, simple and solvent-free bulk measurement, which gives simultaneous analysis of the oil and moisture content with no sample preparation. This is particularly advantageous for busy laboratories or testing stations that measure a large number of samples.

Benefits

The MagStation Lite™, uses the most advanced magnet and data gathering methods combined with high sensitivity probes and electronics to provide the highest quality NMR solutions for the analysis of oils and moisture in seeds.

- Industrial robust electronics give improved precision
- High homogenity magnets for better resolution
- Data analysis techniques for all NMR applications are pre-loaded
- Full diagnostic software with PC Anywhere for remote access
- No sample preparation required for anlaysis
- NMR measures the entire sample volume so no surface effects will result in errors
- NMR is also not effected by color variations of the seeds
- Standard samples for quality control

Calibration

The MagStation Lite is supplied with pre-loaded methods for several types of seed, providing optimised instrument parameters for oil and moisture determination. System calibration can be done at the Progression factory or while on site. Calibrating is simply a matter of running at least three samples from across the production range.

NMR calibrations are made using reference values obtained by other techniques. Since the accuracy of these techniques can vary it is impossible to specify an absolute accuracy. Instead we can look at measurement repeatability as an indication of method performance. The table below shows the typical performance for a major oilseed type—rapeseed (canola).

Typical MagStation Lite results for rapeseed and sunflower samples

	Parameter	Tested range	Mid-range precision 95% confidence
Sunflower	Oil	30 – 55	0.11
	Moisture	5 – 15	0.10
Rapeseed	Oil	30 – 55	0.11
	Moisture	5 – 15	0.10