
ABB MEASUREMENT & ANALYTICS

MB3600-CH30

Laboratory FT-NIR analyzer
for biodiesel applications



Measurement made easy

The MB3600-CH30 analyzer is suitable for production optimization and product quality assessment.

Ease of use

01 Biodiesel
production sites

Biodiesel process optimization

The demand for quality biodiesel product to meet mandated levels of biodiesel incorporation into the diesel transport fuel pool challenges the biodiesel industry to control and optimize what is essentially a difficult small- to medium-scale batch chemical conversion process. The production of biodiesel involves the transesterification of vegetable oil (or similar) feedstocks with methanol in the presence of a base catalyst. The reaction requires careful control and monitoring to reach a satisfactory end result.

Rapid biodiesel analysis for production monitoring

The ABB MB3600-CH30 FT-NIR laboratory biodiesel analyzer is the ideal tool for quick sample analysis for production monitoring. Biodiesel samples can be taken from the process during batch or semi-continuous production and rapidly analyzed for key biodiesel properties and contaminants. Also, the final B100 product can be screened for product quality to assist with fast detection of process issues. The MB3600-CH30 uses Fourier transform near-infrared (FT-NIR) spectroscopy to analyze

biodiesel samples. It can provide a rapid determination of mono-, di- and tri-glyceride content, residual methanol, methyl ester % and other quality parameters in biodiesel for finished product screening and end-point determination in biodiesel reactors.

Guaranteed laboratory-to-process calibration transfer

ABB has developed manufacturing methods which ensure all of our laboratory and process FT-NIR analyzers are highly stable, have a highly linear photometric response, and provide identical absorbance spectra. This guarantees calibration transferability from lab to process without any additional calibration effort or data manipulation.



MB3600-CH30 FT-NIR laboratory biodiesel analyzer

02 MB3600 CH30 FT-NIR
analyser solution

The MB3600-CH30 Laboratory FT-NIR is an accurate, easy-to-use analyzer for determining biodiesel properties in final product and mid-batch biodiesel samples from vegetable oil transesterification reactors. It uses a simple transmission sampling method with disposable glass vials. Application methods and calibrations can therefore be built quickly on site based on typical production run samples.

Simplified analysis and calibration development

The ABB MB3600-CH30 FT-NIR laboratory biodiesel analyzer is supplied with starter calibrations for key biodiesel properties. The simple sampling method using disposable glass sample vials, the short measurement time (about 1 minute) and the sensitivity of the FT-NIR analyzer allow for easy on-site calibration and method development.

MB3600-CH30 results are totally traceable to the reference method and the calibrations are stable, rugged and transferable.

- Rugged design and construction combined with superior manufacturing methods guarantee unsurpassed analyzer stability.
- Results obtained in less than 2 minutes, with simultaneous analysis of multiple biodiesel properties. Easy to use, operator friendly, with very low cost of analysis.
- Simplified sampling using heated disposable glass vials, no clean up between samples, means it is very easy to run large sample batches. Vials are inserted in a heatable universal vialholder that supports different vial sizes (5, 8, 12 mm OD [0.20, 0.31, 0.47 in. OD]) and has USB port for automatic recognition by the analyzer.
- Higher analytical precision (increased repeatability, reproducibility and stability) compared with standard wet chemical methods.
- Very little training required for use by plant personnel in a routine operations environment.
- Extensively field proven for the rapid development of custom site FT-NIR analytical methods.

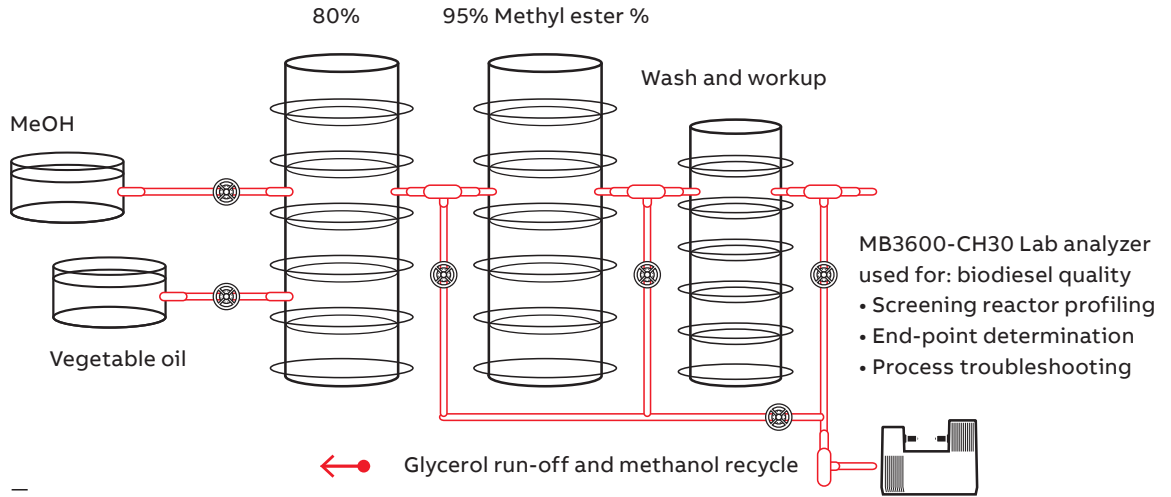
Go to www.abb.com/analytical to discover how ABB can help you to optimize polyol processing operations.



Designed and configured for routine biodiesel analysis

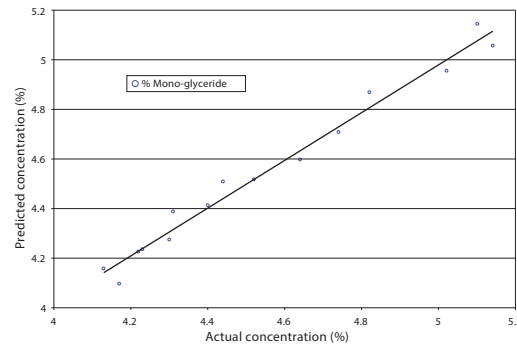
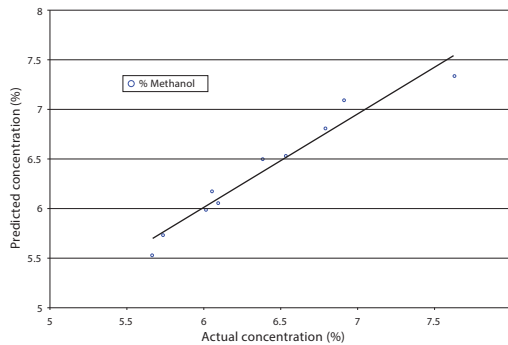
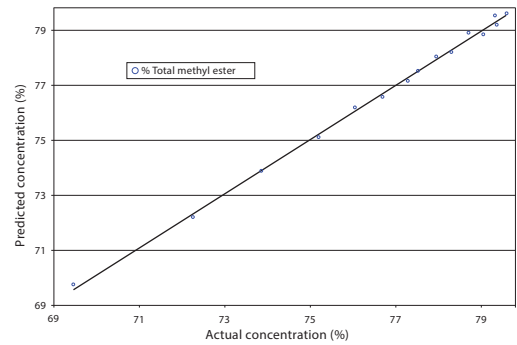
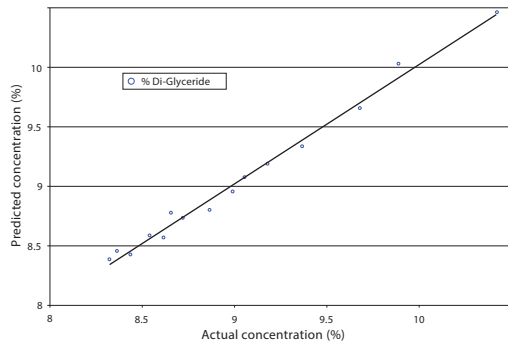
03 Biodiesel transesterification reactor chain

04 Actual vs predicted concentration results for di-glyceride, total methyl ester, methanol and mono-glyceride



03

The MB3600-CH30 laboratory FT-NIR analyzer is designed and configured for routine biodiesel analysis and easy calibration modeling and method preparation. It includes all the hardware, software and accessories required for both biodiesel measurement and chemometrics method development.



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Powerful method-development and measurement tool

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05 Canola field

Property table

Properties	Units	SECV (1 sigma)	Repeatability (r)	Range min.	Range max.
Mono-glyceride	wt%	0.05	0.02	4.1	5.1
Di-glyceride	wt%	0.06	0.01	8.3	10.3
Tri-glyceride	wt%	0.19	0.05	6.7	13.6
Total glycerol	wt%	0.27	0.05	19.1	29.1
Methanol	wt%	0.38	0.004	0	12
Methyl ester	wt%	0.15	0.13	69.5	79.6

The MB3600-CH30 FT-NIR analyzer is a powerful method-development and measurement tool which allows applications to be developed rapidly on site. The calibrations, based on biodiesel reactor profiling, will enable fast troubleshooting and process monitoring of a biodiesel production unit in close to real time, solving the problems associated with slow traditional analyses.

Custom calibration models

The MB3600-CH30 simplifies the development of local site-data based calibration models, allowing the analyzer to be used for a wide range of process streams and properties. Many of our customers have successfully developed their own rigorous and stable calibration models.

ABB's calibration modeling and training services

Custom calibration models can easily be developed to generate QA and batch process monitoring data. These calibrations must be developed on a site-by-site basis for specific product groups. ABB will work in close partnership with you to develop customized solutions that meet your specific needs.

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