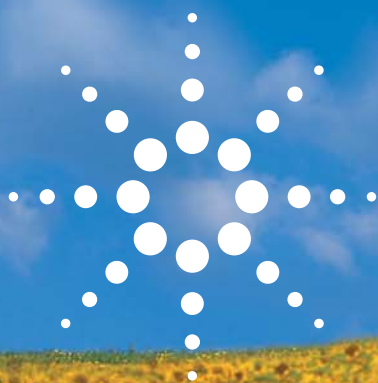


Solutions for biodiesel –
amazing precision that
anyone can achieve

Agilent Biodiesel Analyzers

- Ready-to-go solutions that ensure precision
- Industry-leading knowledge built into each analyzer
- Unrivaled, highest quality hardware and software, expertly configured



Agilent Technologies

Responding to a fast-growing renewable fuel source

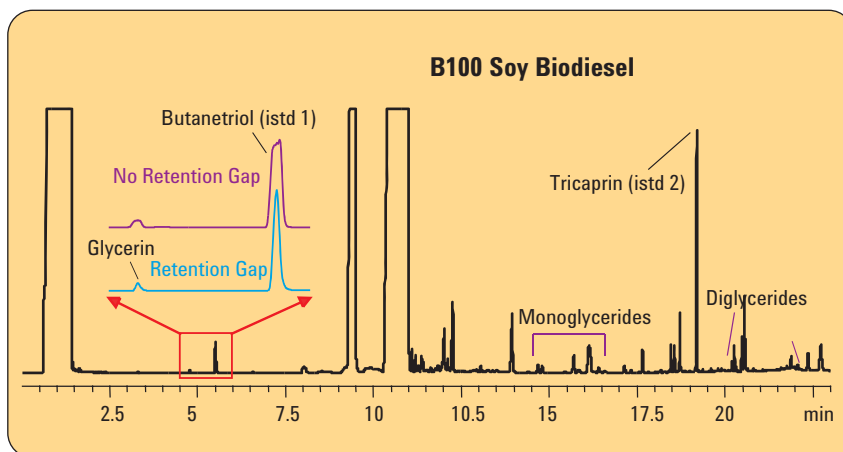


Agilent Technologies has developed a comprehensive set of four biodiesel analyzers all compliant with ASTM and CEN standards.

Measuring Glycerin and Glycerides in Pure Biodiesel B100 – EN 14105/ASTM D6584

Biodiesel is a motor or heating fuel produced from vegetable oils or animal fats. The high cost and limited availability of crude oil make biodiesel and other renewable fuels a viable way to replace, supplement or extend traditional petroleum fuels.

A process called transesterification produces biodiesel. The vegetable oil is reacted with methanol in the presence of a catalyst. This produces a mixture of fatty acid methyl esters (FAME) and glycerin. Once the glycerin and any other contaminants are removed, the remaining FAME mixture is pure biodiesel. Depending on the oil source, a typical biodiesel contains FAME mixtures that have both saturated and unsaturated carbon chains from C8 to C24.



Analysis of soy biodiesel using ASTM D6584/E14105 methods. Inset shows improved peak shape using a retention gap and Microfluidics connector.

- Retention gap significantly improves peak shape for better accuracy, reproducibility as well as extend column life
- Agilent's "Ultimate" union joins retention gap to column for high temperature, leak free, inert, and easy to use connections.
- Uses a standard autosampler syringe instead of special narrow bore syringe – improving reliability and precision
- Exceeds ASTM and CEN specifications for calibration and precision.

Repeatability	EN14105	Observed %(m/m)			
	Spec %(m/m)	Day 1	Day 2	Day 3	Day 4
Free glycerin	0.0016	0.0001	0.0001	0.0001	0.0001
Monoglycerides	0.0380	0.0050	0.0070	0.0070	0.0000
Diglycerides	0.0360	0.0080	0.0080	0.0140	0.0000
Triglycerides	0.0588	0.0077	0.0045	0.0095	0.0040
Total glycerin	0.0174	0.0034	0.0035	0.0047	0.0002

Repeatability for Soybean Oil Biodiesel. Exceeds EN14105 specifications.

Method compliance made simple by Agilent's superior precision!

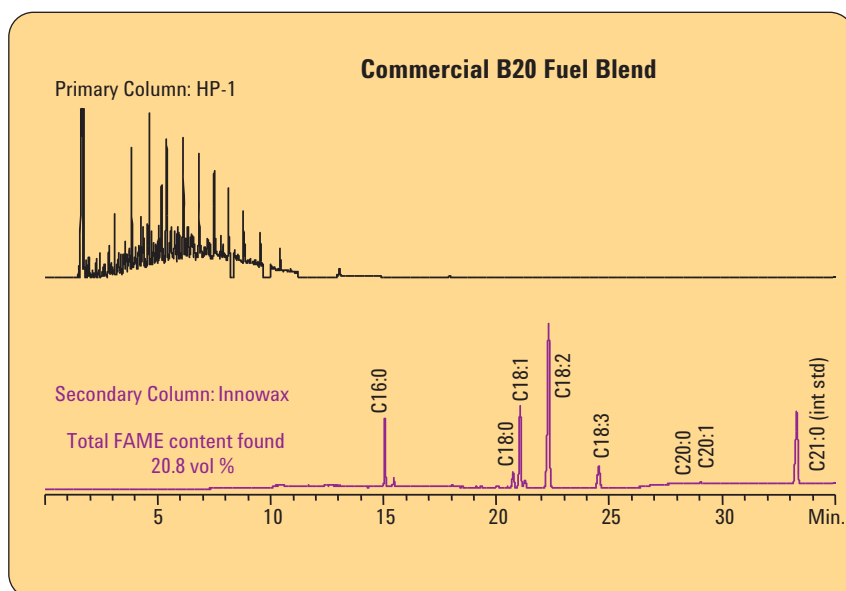
Break through for analyzing biodiesel components in commercial blended fuel – An alternative to EN 14331 method



Improved Analysis of Commercial Biodiesel Blends Using Two Dimensional GC

This method ensures the key FAME compounds are in the biodiesel in the correct proportion. Once again, the Agilent Solution for this simple method exceeds the precision requirements of the method.

A complex sample matrix makes this analysis difficult. However, it is possible to separate the individual FAME compounds from the petroleum hydrocarbons using two-dimensional GC. Existing methods for analyzing only B2 blends requires a complicated and costly sample preparation before GC analysis. Agilent has developed a new 2-D GC method that uses a "Microfluidics" Deans Switch to easily and reproducibly perform this analysis. This method can be used for commercial blended biodiesel fuels from B1 to B25 with no sample preparation.



FAME	Repeatability (% m/m)	
	EN14331 spec	2-D GC
C16:0	0.50	0.03
C18:1	0.60	0.06
C18:3	0.40	0.02

2-D GC Analysis of B20 biodiesel sample using a new Agilent method employing Microfluidics Deans Switch. Exceeds EN 14331 precision specifications.

A key ingredient in all of these analyzers: Agilent innovation.

Ready-to-go Solutions that Ensure Precision



All of the Agilent Biodiesel Solutions come equipped with columns and consumables so analysts can quickly and easily start using their systems to produce results for this fast growing industry. Biodiesel will be even more important in the future. Now is the time to learn more about these excellent solutions for measuring the quality of biodiesel fuels. So take a moment to investigate these applications and their Agilent Solutions.



Biodiesel solutions from Agilent:

- **Determination of free and total Glycerin and Glycerides: EN14105/ASTM D6584**
- **FAME Determination of Ester and Linoleic Acid Methyl Ester Content: EN14103**
- **Determination of Trace Methanol in Biodiesel: EN14110**
- **Microfluidic dean switch for biodiesel blends analysis: Breakthrough alternative to EN 14331**
- **Simulated Distillation of biodiesel: ASTM D2887**
- **Elemental contamination in biodiesel by ICP-MS: EN 14107; EN 14108; EN 14109, and EN14538**

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www.agilent.com/chem

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or Agilent authorized distributor

Compliant
with
ASTM
and CEN
standards

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