



Biodiesel analyser

- EN 14103, EN 14105 / ASTM D6584, EN 14110
- 3 methods in one analyser
- Fully automated sample preparation

GAS offers custom configured GC analysers for many application fields for over 40 years. GAS analysers are designed to meet many standardised methods from GPA, ASTM, UOP, ISO, EN and others. The efficient configurations are based on proven GC technology, resulting in robust instruments with an optimal return on investment.

Biodiesel is an alternative fuel produced from renewable sources such as vegetable oils and organic waste. Specific directives from worldwide authorities have been promoting the use of biodiesel blended with petrodiesel. Biodiesel must meet a set of requirements defined in ASTM and EN standards.

Figure 1. GAS Biodiesel analyser with 2 * GC1300 + Triplus RSH autosampler, providing 3 independent analysis channels for fatty acids, glycerol, glycerides and methanol



Three methods in one

The GAS biodiesel analyser is an efficient and cost-effective solution for 3 biodiesel GC methods integrated in one GC system:

- EN 14103: FAME; ester and linolenic acid methyl ester content
Using SSL (split/splitless injector), Rtx-WAX column (30m*0,32mm; 0.25um), FID. Liquid sample injection.
- EN 14105 / ASTM 6584: Free and total glycerol and mono-, di-, triglyceride content
Using PTV (programmable temperature vaporiser), MXT Biodiesel TG column (15m*0.32mm; 0.1um), FID. Liquid sample injection.
- EN 14110: Methanol content
Using SSL, Rxi-1 column (30m*0.25mm; 1.00um), FID. Headspace injection.

Each method has its own separate analysis channel, so in total 3 sets of injectors, separation columns and flame ionisation injectors are applied. Two independent GC ovens provide optimised separation of all required components, and reduced analysis time.

Figure 2. Triplus autosampler tools for changing syringes. Providing liquid / headspace injection and sample preparation by a single autosampler

Virtually three autosamplers

The versatile Triplus RSH autosampler provides injection of biodiesel samples separately on 3 analysis channels. The flexible injection robot is equipped with liquid syringe tool for EN 14103 and 14105 while EN 14110 requires the headspace syringe tool. See figure 2.

Automated sample preparation and reporting

Automate the entire workflow, from automated methyl ester preparation and standard dilution to injection using a single Triplus autosampler (figure 8), and improve data precision, reproducibility and lab productivity. The operator just has to weigh the sample and place it in the sample tray, and all necessary steps and reporting are completed fully automated (figure 6 and 7).



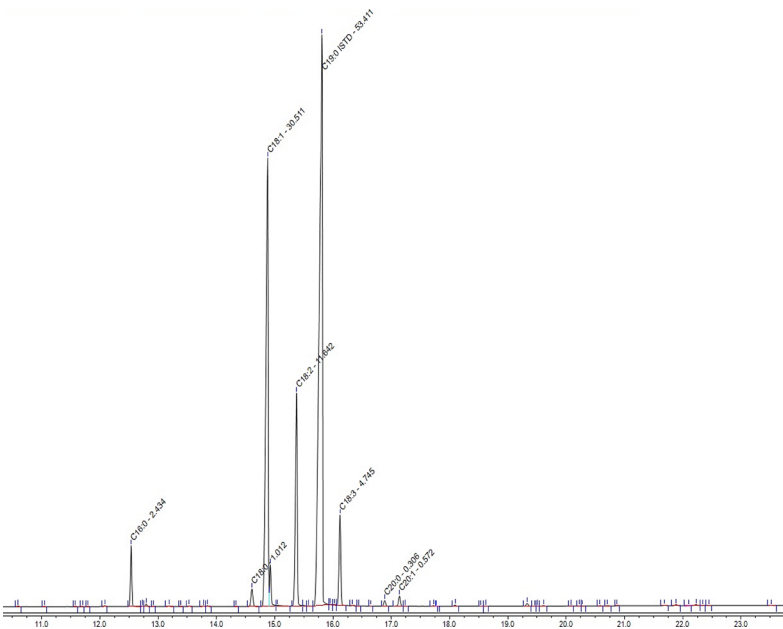


Figure 3. Chromatogram EN 14103. Fatty Acid Methyl Esters (FAME)

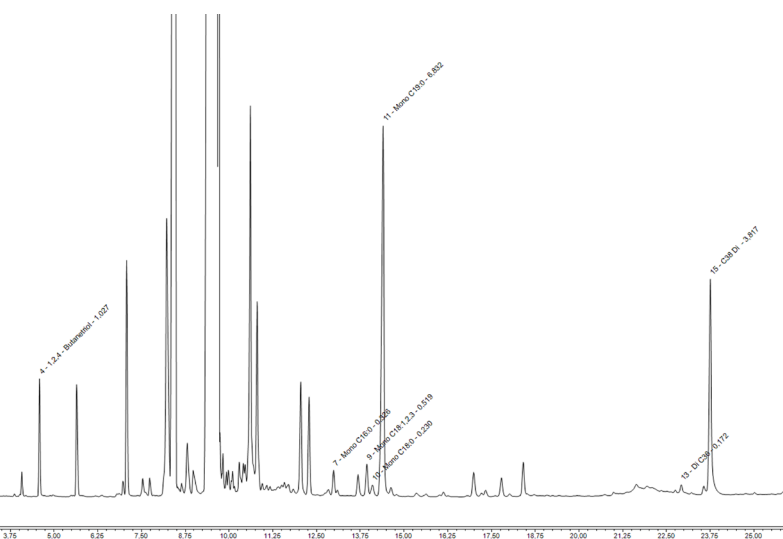


Figure 4. Chromatogram EN 14105. Mono-, di- and triglycerides

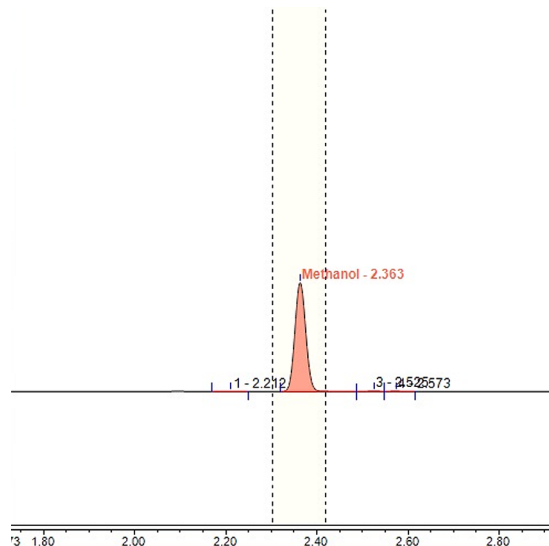


Figure 5. Chromatogram EN 14110. Methanol

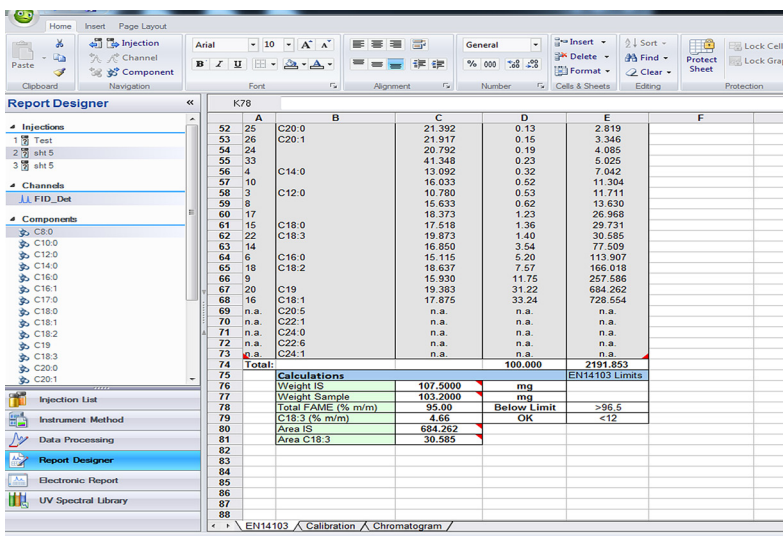


Figure 6. Automated reporting after each run by Chromeleon report designer

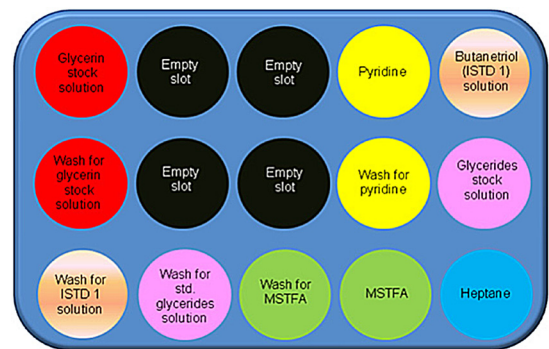


Figure 7. Autosampler tray with vial positions for automatic sample preparation. (according to ASTM D6584)

Specification

Application:	EN 14103: FAME; ester and linolenic acid methyl ester content EN 14105: Free and total glycerol and mono-, di-, triglyceride content EN 14110: Methanol content
Configuration:	3 channel analyser based on 2 units Thermo GC 1300 and Triplus RSH autosampler
Injection type	EN 14103: SSL (Split/Splitless), liquid sample injection EN 14105: PTV (Programmable Temperature Vaporiser), liquid sample injection EN 14110: SSL (Split/Splitless), headspace sample injection
Detection:	FID
Optional:	Backflush on FAME channel (EN 14103), for increased stability by venting the glycerides Fully automated sample preparation based on Triplus RSH autosampler with tray holders, wash station, solvent station, syringe tools, automatic tool changing station, vortex mixer, incubation oven
Sample requirements:	See our pre-installation guide for additional requirements
Analysis time:	30 minutes
Linearity:	10 ⁷
Repeatability:	< 3% RSD
Data systems:	Chromeleon, OpenLab Automatic reporting of sample content, customised sample certificate



Figure 8. Automated sample preparation according to ASTM D6584 using Triplus RSH with tray holders, wash station, solvent station, syringe tools, automatic tool changing station, vortex mixer, incubation oven



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