

Bringing Innovations to Standards

**AC Analytical Controls  
by PAC  
All In One Biodiesel Analyzer**

[www.paclp.com](http://www.paclp.com)



Biodiesel offers an alternative  
to fossil diesel fuel &  
contributes to the reduction of  
greenhouse gas emissions

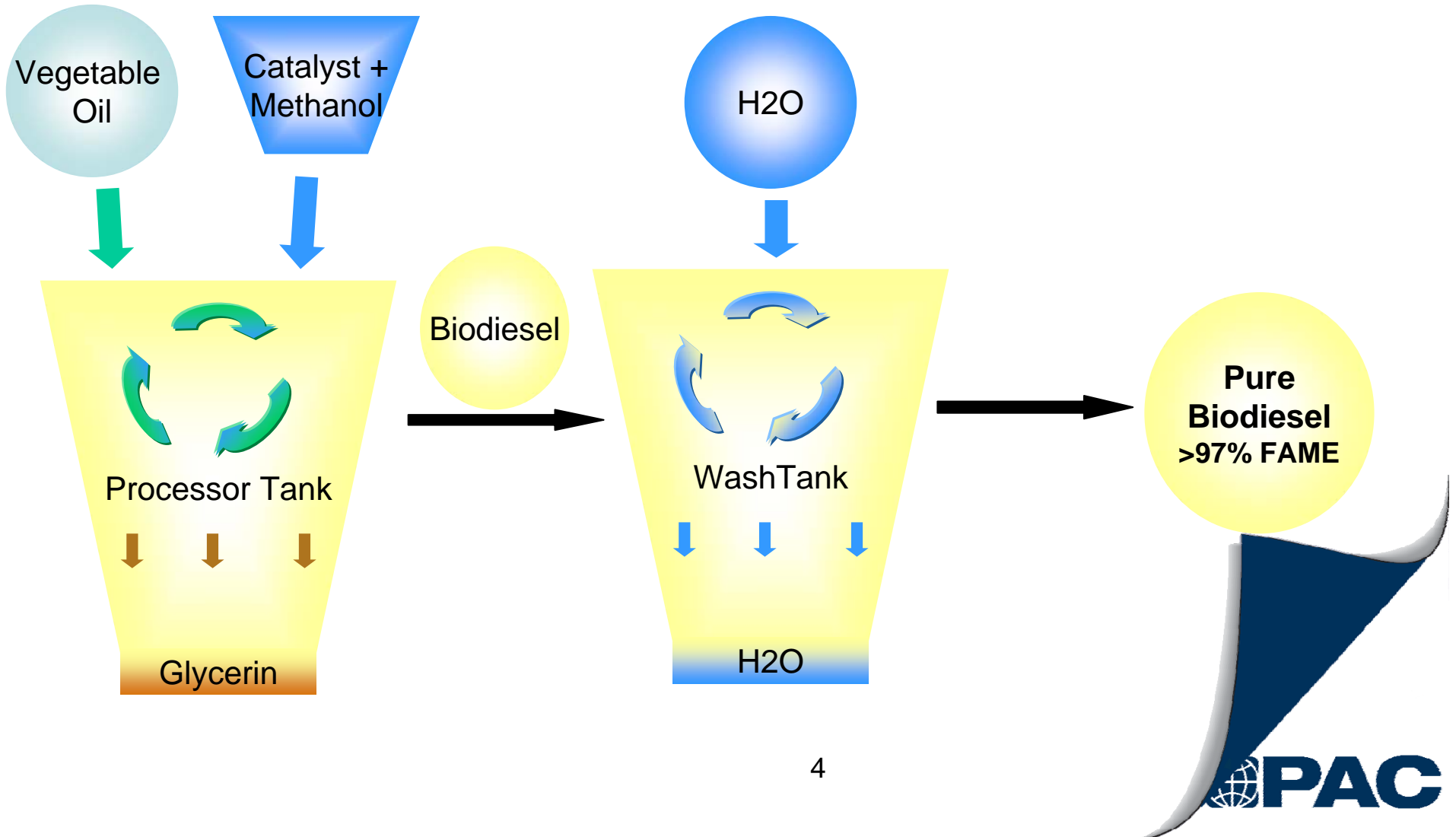


# Biodiesel Analyzer

<b>Analysis Method</b>	<b>Analysis</b>	<b>Inlet</b>	<b>Analysis Time</b>
ASTM D 6584	Free & total glycerin	On-column	35 min
EN 14103	Ester and linoleic acid methyl ester content	Split/splitless	25 min
EN 14105	Free & total glycerol, mono-, di- and tri-glyceride content	On-column	35 min
EN 14106	Free glycerol	Split/splitless	10 min
En 14110	Methanol content	Split/splitless	10 min

Complies with all ASTM and EN chromatographic test methods listed in the FAME specifications EN 14214 or ASTM D6751

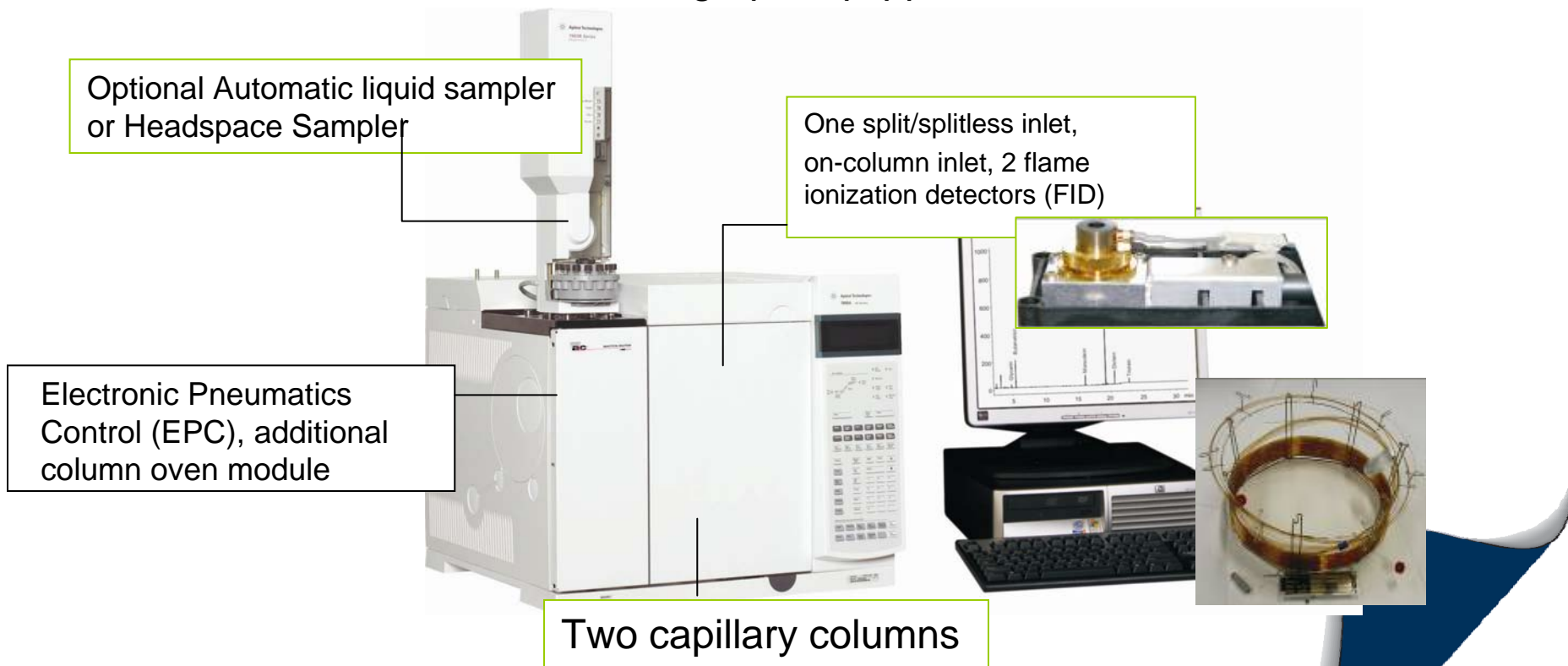
# Biodiesel





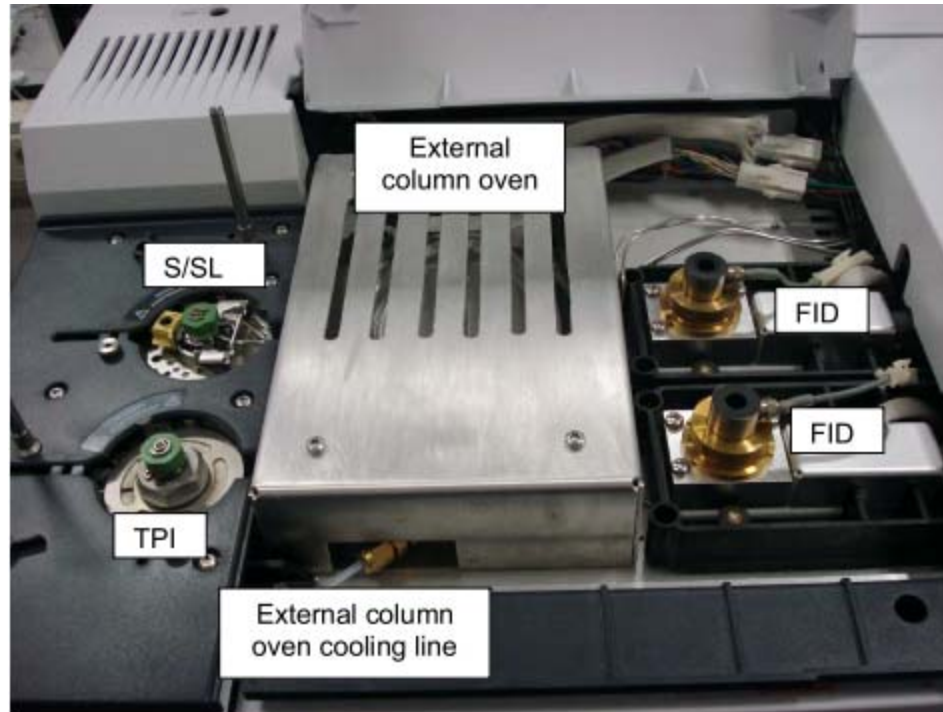
# Hardware Configuration

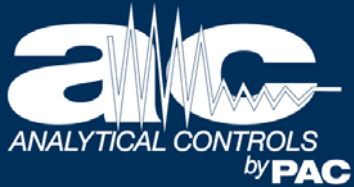
The All In One AC Biodiesel Solution uses the Agilent Technologies 7890 Series gas chromatograph equipped with:



# Hardware Configuration

The All In One AC Biodiesel Solution uses the Agilent Technologies 7890 Series gas chromatograph equipped with:





# Cost-effective design

AC Analytical Controls' All In One Biodiesel Analyzer by PAC allows to **combine all** ASTM & EN chromatographic tests listed in Biodiesel Specifications EN 14214 & ASTM D 6751 in a **single** Agilent 7890 GC.



Analyzers are **tested individually** to proof compliance with specified methods.

Component	Specification coefficient	Result
Glycerol	> 0.99	0.9946
Monoolein	> 0.99	0.99359
Dirolein	> 0.99	0.99548
Triolein	> 0.99	0.9963

Results are reported for each analyzer

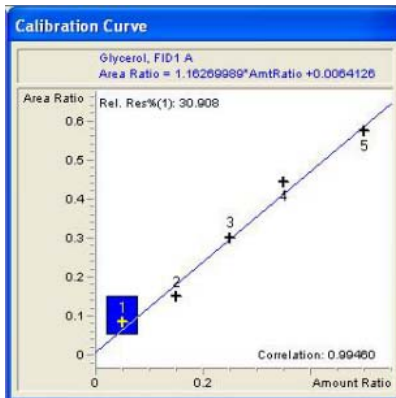


Figure-2: Glycerol calibration curve

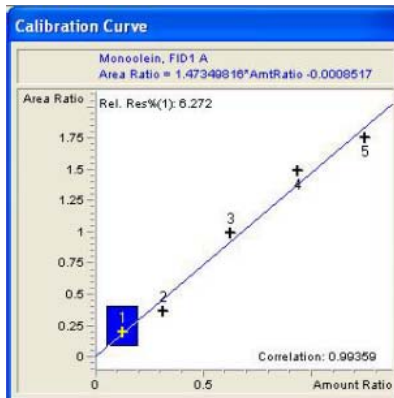


Figure-3: Monoolein calibration curve

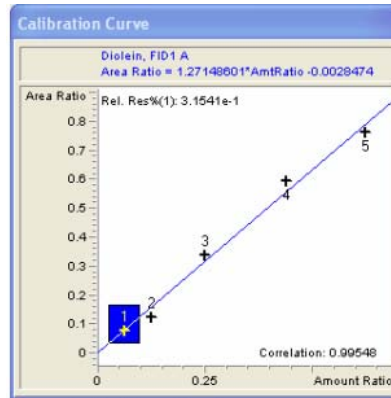


Figure-4: Dirolein calibration curve

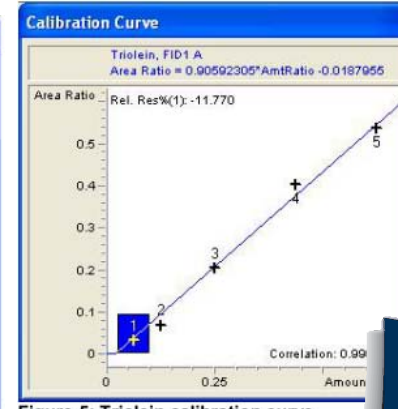


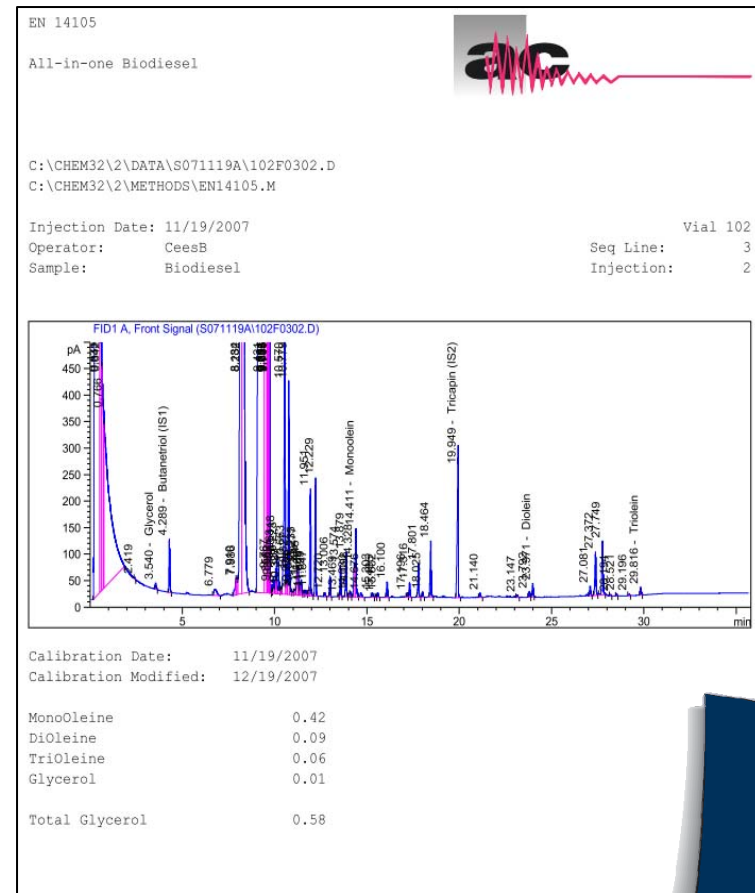
Figure-5: Triolein calibration curve

## ASTM D 6584 - Determination of free and total glycerol and residual mono-, di- and triglyceride

Reporting

Complies with  
requirements as  
described in the  
Standard Method

Calculations listed in the  
method are  
automatically reported

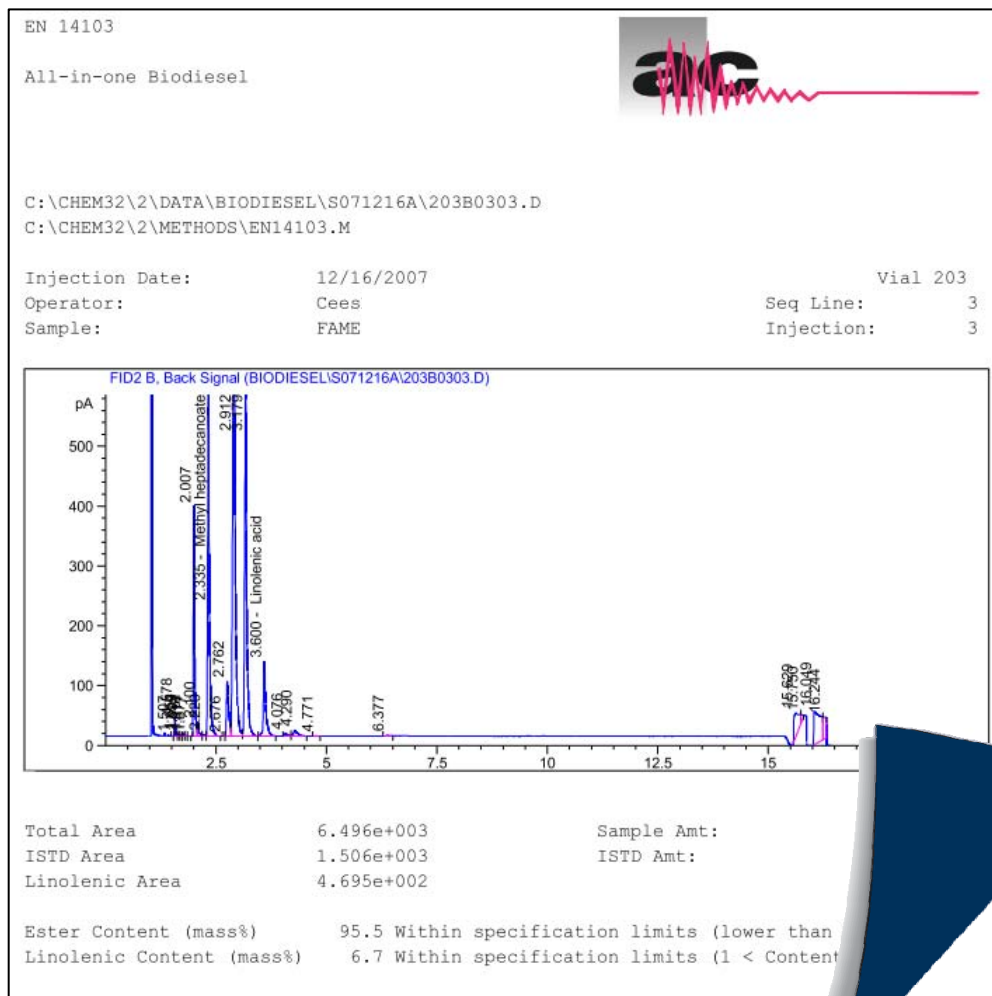


## EN 14103 - Determination of ester & linolenic acid methyl esters content

Reporting

Complies with  
requirements as  
described in the  
Standard Method

States if FAME  
complies with  
specification

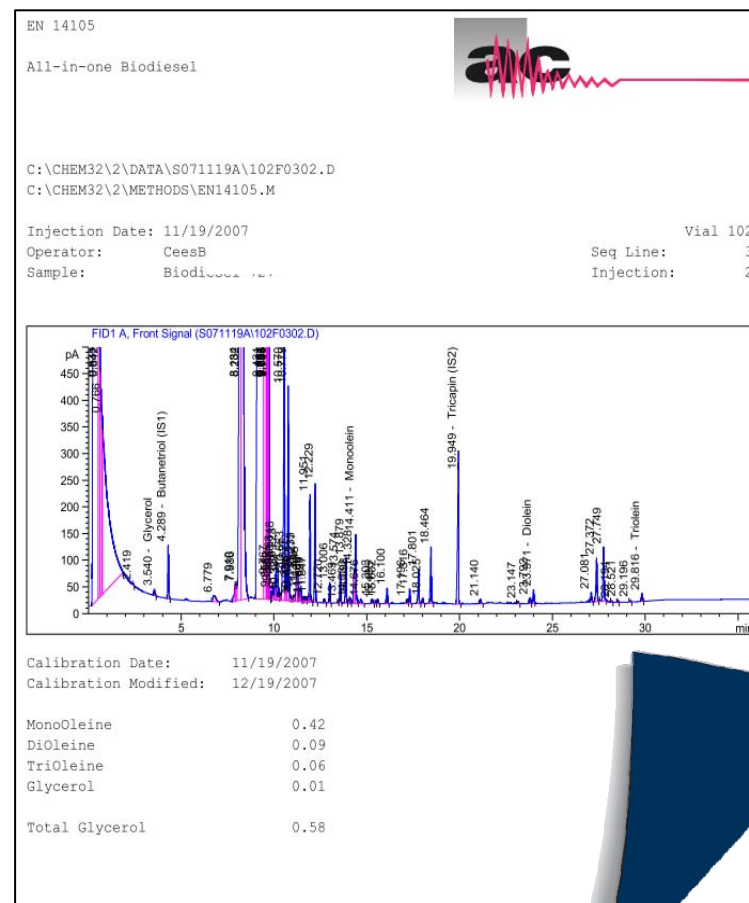


## EN 14105 - Determination of free and total glycerol and residual mono-, di- and triglyceride

Reporting

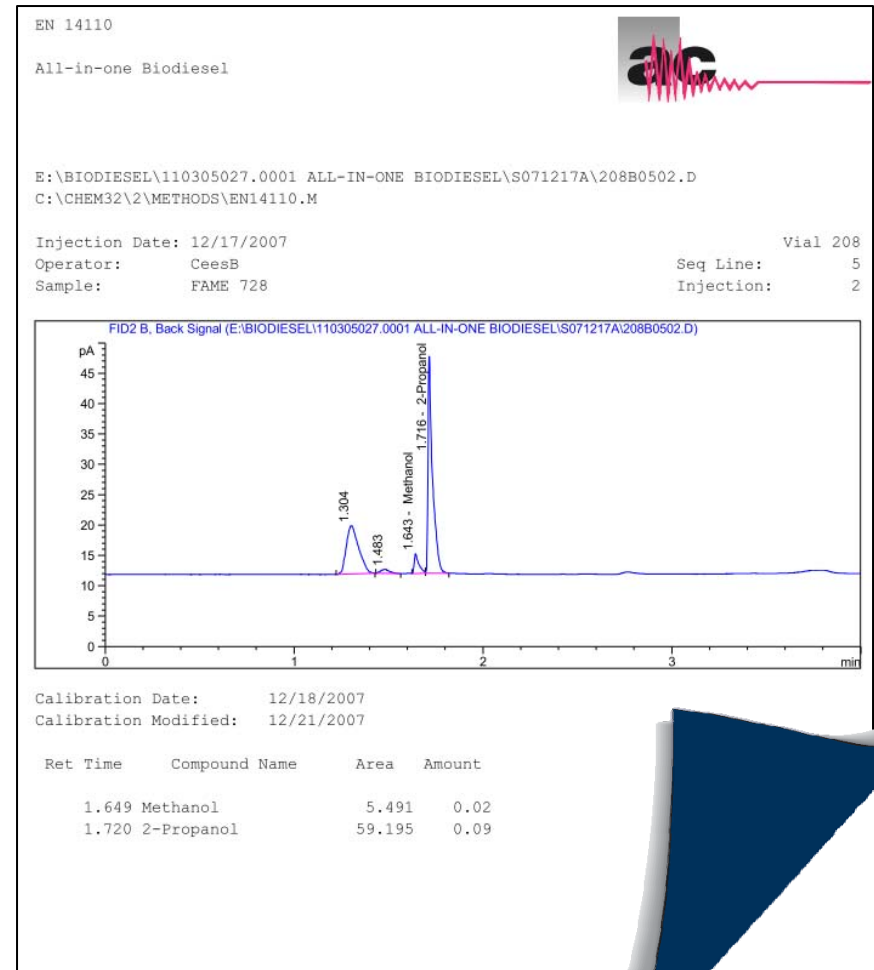
Complies with requirements as described in the Standard Method

Calculations listed in the method are automatically reported



## EN 14110 - Determination of methanol content

Alternative direct  
injection method  
possible instead  
of headspace



## EN 14110 - Determination of methanol content

Each system is checked for calibration and resolution

Correlation coefficient	Specification	Found
Methanol	> 0.95	> 0.99

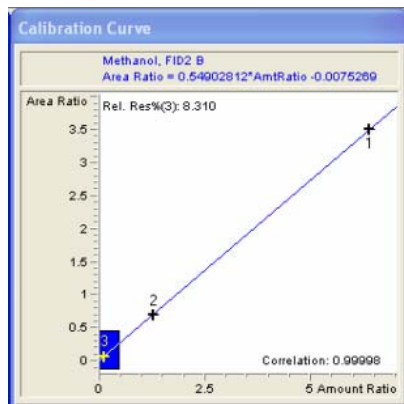


Figure-6: Methanol calibration curve

Component	Specification	Result
Methanol - 2-Propanol	>1.5	2.73

System comes with calibration, internal standards and reagents materials

EN 14103

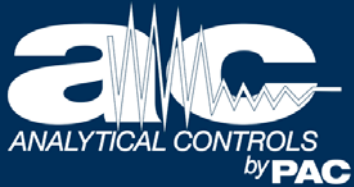
AC partnumber	AC description
Not supplied	Heptane (solvent)
00.80.551	Methyl heptadecanoate

EN 14105 & ASTM D 6584

AC partnumber	AC description
00.03.002	EN14105 & D6584 individual standard solution and internal standard kit
00.03.005	N-Methyl-N-trimethylsilyltrifluoroacetamide (MSTFA)
Not supplied	Heptane (solvent)
Not supplied	Pyridine (solvent)

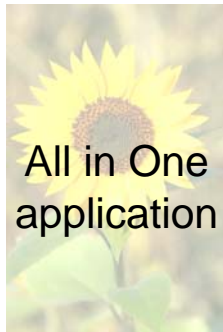
EN 14110

AC partnumber	AC description	Concentration
00.03.008	2-Propanol	ISTD
00.03.009	Methanol	various



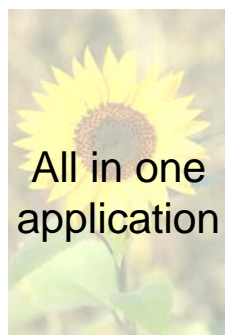
# Features & Benefits

All In One application combines all current chromatographic ASTM & EN methods in one GC

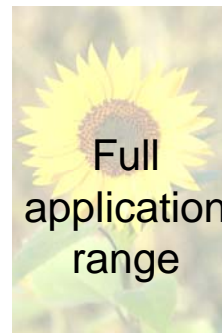


# Features & Benefits

Complies with EN 14214 and ASTM D 6751  
biodiesel specifications

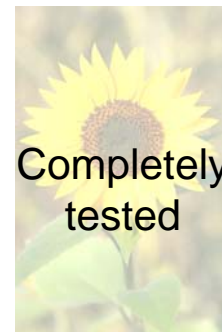
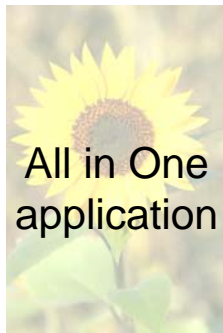


Software is compatible with various chromatographic data systems such as Atlas, ChemStation and EZchrom



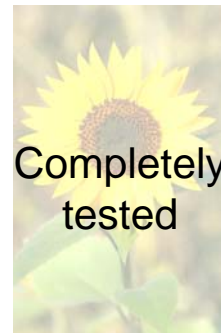
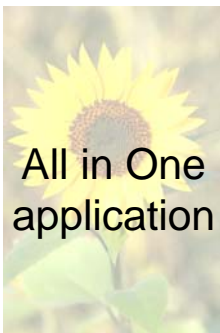
# Features & Benefits

Completely tested according to the specified methods



# Features & Benefits

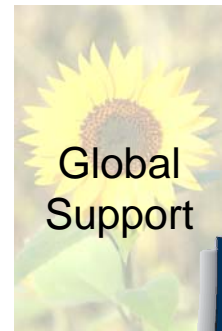
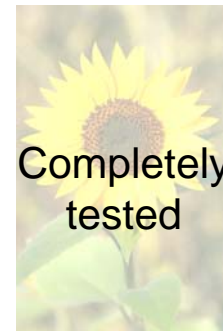
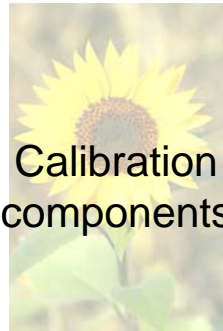
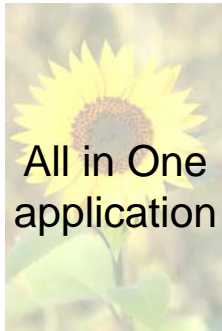
Includes multiple sets of calibration components, internal standards and reagents



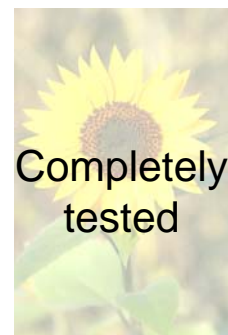


# Features & Benefits

Global network of AC certified support engineers install system on-site and familiarizes users with operation



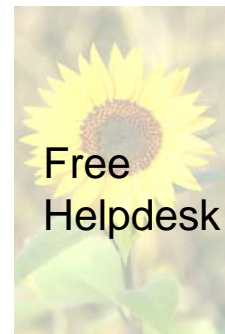
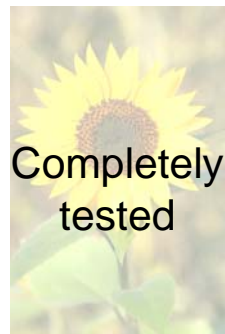
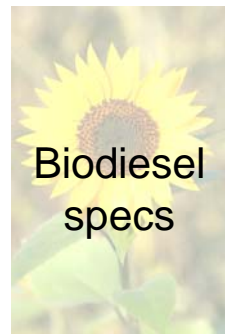
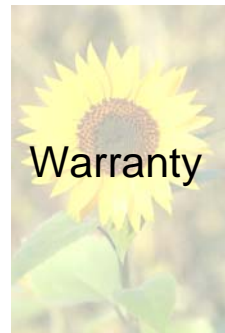
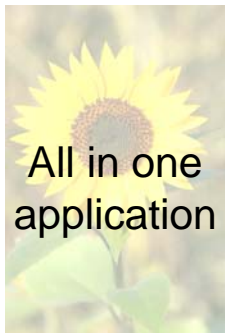
One year warranty covers hardware and application



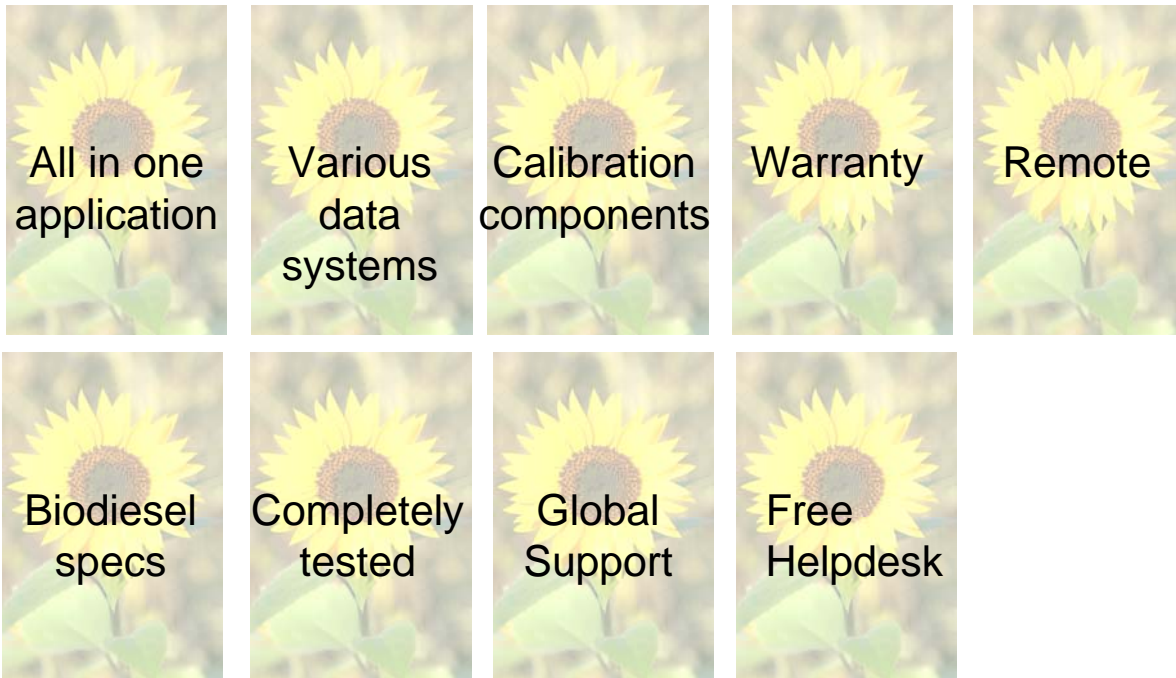


# Features & Benefits

Analyzers include free helpdesk assistance for any hardware or software related questions



Optional on-line remote support  
by LAN connection is available



**AC Analytical Controls by PAC  
offers an All In One Biodiesel solution  
covering all the current specification test methods.**

