

The Biomarker Catalogue



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EN standards



The collection of reference standards
- 2008 -



EN standards

EN 12916:2006

Aromatic compounds in middle distillates

Petroleum products – Determination of aromatic hydrocarbon types in middle distillates.
High performance liquid chromatography method with refractive index detection.

This European Standard specifies a test method for the determination of the content of mono-aromatic, di-aromatic and tri+-aromatic hydrocarbons in diesel fuels that may contain fatty acid methyl esters (FAME) up to 5% (V/V) and petroleum distillates in the boiling range 150-400°C.

System calibration standards:

S-4491-ASS-5HP

EN 12916 System Calibration Standards 1 (SCS1)

7 Analytes, each concentration as listed in n-heptane; units: 1x5mL or 5x5mL

Weight% based on the nearest 0.1mg

1301.6	Cyclohexane (5.1)	[110-82-7]	1.0g/100mL
0332.18	1-Phenyldodecane (5.3)	[123-01-3]	0.1g/100mL
1267.81	2-Dimethylbenzene (5.4)	[95-47-6]	0.5g/100mL
2685.12	Hexamethylbenzene (5.5)	[87-85-4]	0.01g/100mL
0711.10	Naphthalene (5.6)	[91-20-3]	0.01g/100mL
0884.12	Dibenzothiophene (5.9)	[132-65-0]	0.05g/100mL
0461.15	9-Methylanthracene (5.10)	[779-02-2]	0.05g/100mL

S-4492-ASS-5HP

EN 12916 System Calibration Standards 2 (SCS2)

2 Analytes, each concentration as listed in n-heptane; units: 1x5mL or 5x5mL

3416	FAME (5.12) as Linoleic acid methyl ester	(3268.19)	0.4g/100mL
0212.18	Chrysene (5.11)		0.04g/100mL

See EN 14214, page 44.

S-4493-ASS-HP

EN 12916 Calibration Standards

S-4493-ASS-5HP

4 Analytes, each concentration as listed in n-heptane; units: 4x1.5mL Certan® bottle, 4x5mL screw cap bottle

Calibration Standard	1,2-Dimethylbenzene g/100mL	Fluorene g/100mL	Phenanthrene g/100mL
A	4.0	2	0.4
B	1.0	1.0	1.0
C	0.25	0.25	0.05
D	0.05	0.02	0.01



EN 12916 Additional standards, see the Compounds section and the Applications / Petroleum sections:

Nonaromatics:

n-Paraffin mixtures
Cyclohexane mix
Naphthene/paraffin mixtures
Mono-alkenes

Monoaromatics:

Alkylbenzene mix
Tetralines
Indanes
Naphthenobenzenes (octahydrophenanthrenes)
Thiophenes
Styrenes
Conjugated polyalkenes

Diaromatics:

See the PAH-section, naphthalenes, biphenyls, acenaphthenes, benzo- and dibenzothiophenes

Triaromatics:

NDP- and NDP/PAH-mixtures
PAH-section: phenanthrenes, pyrenes, fluoranthenes, chrysenes, triphenylenes, benzanthrenes, triaromatic steranes

Please inquire by fax or e-mail for custom made mixes

EN 14078:2004

Liquid petroleum products – Determination of Fatty Acid Methyl Esters (FAME) in middle distillates - Infrared spectroscopy method

This European standard specifies a test method for the determination of Fatty Acid Methyl Ester (FAME) content in diesel fuel or domestic heating fuel by mid infrared spectrometry in the range 1.7% to 22.7% (V/V).

FAME calibration solutions

S-4495-SET-10CY FAME*, as Linoleic acid methyl ester (Chiron No. 3268.19.), concentration in cyclohexane 1, 2, 4, 6, and 10 g/L; unit: 5x10mL

*Fame: EN 14214, page 44.

EN 14103:2003

FAME for use in biofuels, diesel fuels

Fat and oil derivatives – Fatty Acid Methyl Esters (FAME) - Determination of ester and linolenic acid methyl ester contents

The purpose of this European Standard is to determine the content of fatty acid methyl esters (FAME) intended for use as biofuels or as a blending component for heating and diesel fuels. It also allows the determination the linolenic acid methyl ester content. It allows one to verify the ester content of FAME is greater than 90% by mass (m/m) and that the linolenic acid content is between 1% and 15%. The method is suitable for FAME which contains methyl esters between C14 and C24.



Internal standard

3165.18-10K-30HP	Methyl heptadecanoate, 99+%			
	10 mg/mL in n-heptane, 30 mL			
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S-4496-100-AC	FAME Reference Mixture (rape seed methyl esters):			
	13 Analytes, each 100µg/mL each /mL in acetone; unit: 1x1mL			
3164.17	Palmitic	C16	[57-10-3]	
3262.17	Palmitolic	C16:1	[1120-25-8]	
3165.18	Heptadecanoic	C17	[506-12-7]	Internal standard
1398.19	Steraric	C18	[112-61-8]	
3273.19	Oleic	C18:1	[112-8-1]	
3268.19	Linoleic	C18:2	[112-63-0]	
3266.19	Linolenic	C18:3	[301-00-8]	
3169.21	Arachdic	C20	[1120-28-1]	
3232.21	Eicosenoic acid (11c)	C20:1	[5561-99-9]	
3171.23	Behenic	C22	[929-77-1]	
3299.23	Erucic	C22:1	[1120-34-9]	
3173.25	Lignoceric	C24	[2442-49-1]	
3302.25	Nervonic	C24:1	[2733-88-2]	

EN 14105:2003

NEW

Fat and oil derivatives – Fatty Acid Methyl Esters (FAME) -Determination of free and total glycerol and mono-, di-, triglyceride contents (Reference method)

This European Standard specifies a method to determine the free glycerol and residual mono-, di-and triclyceride contents in fatty acid methyl ester (FAME) intended for addition to mineral oils. The total glycerol content is then calculated from the results obtained.

This method is suitable for FAME from rapeseed, sunflower and soybean oils, but is not suitable for FAME produced from or containing coconut and palm kernel oils because of overlapping of peaks.

Derivatizing agent

1941.6-1ML	N-methyl-N-trimethylsilyltrifluoroacetamide (MSTFA)	
1941.6-5G	[10416-59-6]	1mL, 5 g neat

Internal standards

3642.4-1ML	1,2,4-Butanetriol (Internal Standard No. 1)	
	[3068-00-6]	1mL neat
3643.33-1ML	1,2,3-Tricaproylglycerol (tricaprin, Internal Standard No. 2)	
	[621-71-6]	1mL neat



3642.4-K-10PY **Internal Standard No. 1 stock solution**
1000µg/mL in dry pyridine 1x10 mL

3643.33-K-10PY **Internal Standard No. 2 stock solution**
1000µg/mL in dry pyridine 1x10 mL

Reference substances

3837.3	Glycerol	[56-81-5]
3838.21	1-Monooleoylglycerol (monoolein)	[111-03-5]
3839.39	1,3-Dioleoylglycerol (diolein)	[25637-84-7]
3840.57	1,2,3-Trioleoylglycerol (triolein)	[122-32-7]

3644.3-500-10PY **Glycerol stock solution**
500µg/mL in dry pyridine 1x10 mL

3645.21-5K-10PY **1-Monooleoylglycerol (monoolein) stock solution**
5000µg/mL in dry pyridine 1x10 mL

3646.39-5K-10PY **1,3-Dioleoylglycerol (diolein) stock solution**
5000µg/mL in dry pyridine 1x10 mL

3647.57-5K-10PY **1,2,3-Trioleoylglycerol (triolein) stock solution**
5000µg/mL in dry pyridine 1x10 mL

S-4497-10K-10PY **Monoglycerides:**
3 analytes, each 10 mg/mL in dry pyridine; unit: 1x10 mL

3648.19	Monopalmitoylglycerol (monopalmitin)	[542-44-9]
3649.21	Monostearoylglycerol (monostearin)	[123-94-4]
3650.21	Monooleoylglycerol (monoolein)	[111-03-5]

Calibration solutions

Calibration solution	1	2	3	4	Syringe, µL
µL of glycerol solution	10	40	70	100	100
µL of monoolein solution	50	120	190	250	500
µL of diolein solution	10	40	70	100	100
µL of triolein solution	10	30	60	80	100
µL of internal standard sol. No.1	80	80	80	80	100
µL of internal standard sol. No.2	100	100	100	100	500

To be prepared daily from the above solutions



EN 14214:2003

Automotive fuels - Fatty acid methyl esters (FAME) for diesel engines - Requirements and test methods

This European standard exists in parallel with:

EN 590 “Automotive fuels – Diesel – Requirements and test methods”.

EN 14214:2003 Requirements

Property	Unit	Min	Max	Method
Ester content	% (m/m)	96.5		EN 14103
Density at 15°C	kg/m ³	860	900	EN ISO 3675 EN ISO 12185
Viscosity at 40°C	mm ² /s	3.50	5.00	EN ISO 3104
Flash point	°C	120	-	prEN ISO 3679
Sulfur content	mg/kg	-	10.00	prEN ISO 20846 prEN ISO 20884
Carbon residue (on 10% distillation residue)	% (m/m)	-	0,30	EN ISO 10370
Cetane number		51.0		EN ISO 5165
Sulfated ash content	% (m/m)		0.02	ISO 3987
Water content	mg/kg	-	0.02	EN ISO 12937
Total contamination	mg/kg	-	24	EN 12662
Copper strip corrosion rating (3 h at 50°C)	Class 1			EN ISO 2160
Oxidation stability, 110°C hours		6.0		EN 14112
Acid value	mg KOH/100 gr		0.50	EN 14104
Iodine number	gr iodine/100g		120	EN 14111
Linolenic acid methyl ester	% (m/m)		12.0	EN 14103
Polyunsaturated (≥4 double bonds)	% (m/m)		1	
Methanol content	% (m/m)		0.80	EN 14110
Monoglyceride cont.	% (m/m)		0.80	EN 14105
Diglyceride content	% (m/m)		0.20	EN 14105
Triglyceride cont.	% (m/m)		0.20	EN 14105
Free glycerol	% (m/m)		0.02	EN 14105 EN 14106
Total glycerol	% (m/m)		0.25	EN 14105
Gr. I metals (Na+K)	mg/kg		5.0	EN 14108 EN 14109
Gr. II met. (Ca+Mg)	mg/kg		5.0	prEN 14538
Phosphorous cont.	mg/kg		10.00	EN 14107

Atmospheric equivalent temperature, 90 % recovered