

Biofuel Analysis

Certified Reference Standards



AccuStandard®

Available in Canada from ...



**CHROMATOGRAPHIC
SPECIALTIES INC.**

1-800-267-8103 • www.chromspec.com • tech@chromspec.com



ASTM, EN and IP standard test methods have been developed to monitor the properties of chemical impurities and physical properties for the application of testing biofuels and biofuel blends.

The source materials that are used to produce these fuels include plant oils, ethyl alcohol (usually from corn) and vegetable waste products.

AccuStandard offers:

- Physical properties such as viscosity and flash point
- Chemical classes such as Glycerins, FAMES and the Hydrocarbon fraction.
- All products are derived from ASTM, EN and IP Standard Methods
- New standard methods include, EN15779, EN12916 and IP391/07



Refinery and Consumer Grade Biofuels

Compound	Qty. / Conc.	Matrix	Cat. No.	Unit
Biofuel 20	0.5 mg/mL	Dichloromethane	BF-FU-030-D	2 mL
	20 mg/mL	Dichloromethane	BF-FU-030-D-40X	2 mL
Biofuel 100 (Consumer grade)	0.5 mg/mL	Dichloromethane	BF-FU-029-D	2 mL
	20 mg/mL	Dichloromethane	BF-FU-029-40X	2 mL
Biofuel 100	0.5 mg/mL	Dichloromethane	BF-FU-032-D	2 mL
	20 mg/mL	Dichloromethane	BF-FU-032-D-40X	2 mL

ASTM D6584 / EN14105 Free and Total Glycerin in Biodiesel by GC

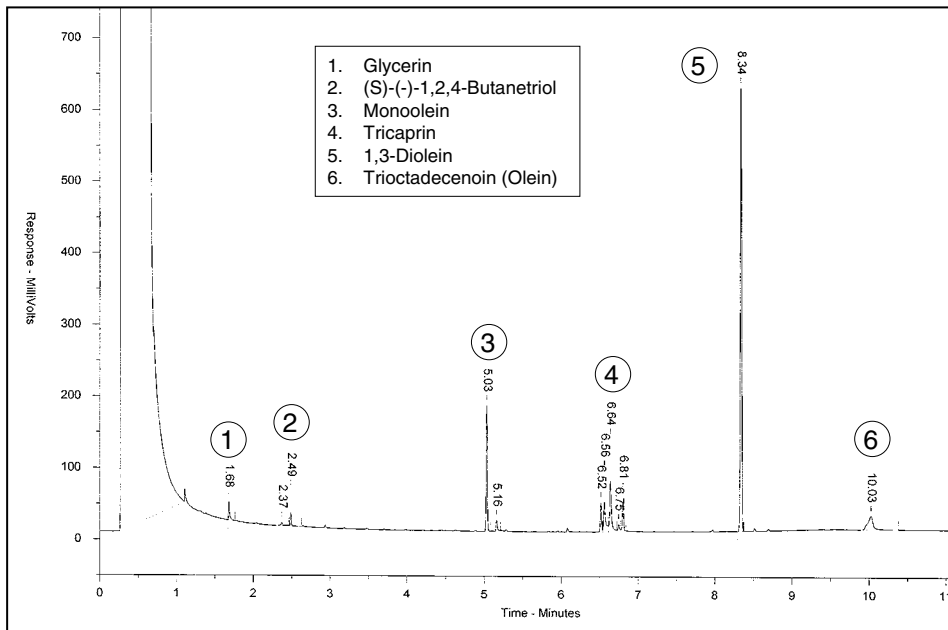
Compound	Qty. / Conc.	Matrix	Cat. No.	Unit
Glycerin	0.5 mg/mL	Pyridine	BF-D-6584-01	2 mL
Monoolein	5 mg/mL	Pyridine	BF-D-6584-02	2 mL
1,3-Diolein	5 mg/mL	Pyridine	BF-D-6584-03	2 mL
Triolein	5 mg/mL	Pyridine	BF-D-6584-04	2 mL
(S)-(-)-1,2,4-Butanetriol	1 mg/mL	Pyridine	BF-D-6584-05-IS	5 mL
Tricaprin	8 mg/mL	Pyridine	BF-D-6584-06	5 mL
MSTFA	5 mL	Neat	BF-D-6584-07N	5 mL
SET of 7 above compounds			BF-D-6584-SET	7 units

Mix of above compounds, on right (MSTFA separate)

ASTM D6584 Mixture

BF-D-6584-MIX	1 mL
At stated conc. in Pyridine	6 comps.
Glycerol	0.5 mg/mL
Monoolein	5 mg/mL
1,3-Diolein	5 mg/mL
Triolein	5 mg/mL
(S)-(-)-1,2,4-Butanetriol	1 mg/mL
Tricaprin	8 mg/mL

Note: MSTFA (**BF-D-6584-07N**) can be ordered separately.



Solution I

EN-14105-01 1 mL
At stated ($\mu\text{g/mL}$) conc. in Pyridine
6 comps.

(s)-(-)-1,2,4-Butanetriol	80
Monoolein	250
Diolein	50
Triolein	50
Glycerol	5
Tricaprin	8

Solution II

EN-14105-02 1 mL
At stated ($\mu\text{g/mL}$) conc. in Pyridine
6 comps.

(s)-(-)-1,2,4-Butanetriol	80
Monoolein	600
Diolein	200
Triolein	150
Glycerol	20
Tricaprin	800

Solution III

EN-14105-03 1 mL
At stated ($\mu\text{g/mL}$) conc. in Pyridine
6 comps.

(s)-(-)-1,2,4-Butanetriol	80
Monoolein	950
Diolein	350
Triolein	300
Glycerol	35
Tricaprin	800

Solution IV

EN-14105-04 1 mL
At stated ($\mu\text{g/mL}$) conc. in Pyridine
6 comps.

(s)-(-)-1,2,4-Butanetriol	80
Monoolein	1250
Diolein	500
Triolein	400
Glycerol	50
Tricaprin	800

EN14103 Fatty Acid Methyl Esters (FAMES)

The methyl esters in the mixture are those derived from typical glycerides present in biomass sources.

Soy & Corn

BF-SOY-ME	100 mg
16:0 Palmitate	6% Wt.
18:0 Stearate	3% Wt.
20:0 Arachidate	3% Wt.
18:1 Oleate	35% Wt.
18:2 Linoleate	50% Wt.
18:3 Linolenate	3% Wt.

Rapeseed Oil

BF-RAP-ME	100 mg
14:0 Myristate	1% Wt.
16:0 Palmitate	4% Wt.
18:0 Stearate	3% Wt.
20:0 Arachidate	3% Wt.
22:0 Behenate	3% Wt.
24:0 Lignocerate	3% Wt.
18:1 Oleate	60% Wt.
22:1 Erucate	5% Wt.
18:2 Linoleate	12% Wt.
18:3 Linolenate	5% Wt.
20:1 Eicosenoate	1% Wt.

Palm Kernel

BF-PALM-ME	100 mg
8:0 Caprylate	7% Wt.
10:0 Caprate	5% Wt.
12:0 Laurate	48% Wt.
14:0 Myristate	15% Wt.
16:0 Palmitate	7% Wt.
18:0 Stearate	3% Wt.
18:1 Oleate	12% Wt.
18:2 Linoleate	3% Wt.

Beef Tallow & Palm Oil

BF-BT-ME	100 mg
14:0 Myristate	2% Wt.
16:0 Palmitate	30% Wt.
16:1 Palmitoleate	3% Wt.
18:0 Stearate	14% Wt.
18:1 Oleate	41% Wt.
18:2 Linoleate	7% Wt.
18:3 Linolenate	3% Wt.

Percent Methanol Calibration Standard Set (EN14110)

BF-MEOH-SET	5 x 1 mL
BF-MEOH-1X (100 µg/g)	BF-MEOH-25X (2500 µg/g)
BF-MEOH-5X (500 µg/g)	BF-MEOH-50X (5000 µg/g)
BF-MEOH-10X (1000 µg/g)	
Methanol in Water	

Technical Note

Individual mixes packaged under nitrogen for stability.

EN15779 Polyunsaturated Fatty Acid Methyl Esters (PUFAMES)



PUFAMES

EN-15779	1 mL
At stated (0.25 %w/v) conc. in Heptane	4 comps.
Docosahexaenoic acid methyl ester	
cis-7,10,13,16,19-Docosapentaenoic acid methyl ester	
Arachidonic acid methyl ester	
Eicosapentaenoic acid	

Internal Standard

EN-15779-IS	1 mL
1.0 mg/mL in Heptane	4 comps.
Methyl tricosanoate	

Fatty Acid Ethyl Esters (FAEEs)

Ethyl Esters in Soy & Corn

BF-SOY-EE	100 mg
16:0 Ethyl palmitate	6% Wt.
18:0 Ethyl stearate	3% Wt.
20:0 Ethyl arachidate	3% Wt.
18:1 Ethyl oleate	35% Wt.
18:2 Ethyl linoleate	50% Wt.
18:3 Ethyl linolenate	3% Wt.

Ethyl Esters in Rapeseed Oil

BF-RAP-EE	100 mg
14:0 Ethyl myristate	1% Wt.
16:0 Ethyl palmitate	4% Wt.
18:0 Ethyl stearate	3% Wt.
20:0 Ethyl arachidate	3% Wt.
22:0 Ethyl behenate	3% Wt.
24:0 Ethyl lignocerate	3% Wt.
18:1 Ethyl oleate	60% Wt.
22:1 Ethyl erucate	5% Wt.
18:2 Ethyl linoleate	12% Wt.
18:3 Ethyl linolenate	5% Wt.
20:1 Ethyl eicosenoate	1% Wt.

Ethyl Esters in Palm Kernel Oil

BF-PALM-EE	100 mg
8:0 Ethyl caprylate	7% Wt.
10:0 Ethyl caprate	5% Wt.
12:0 Ethyl laurate	48% Wt.
14:0 Ethyl myristate	15% Wt.
16:0 Ethyl palmitate	7% Wt.
18:0 Ethyl stearate	3% Wt.
18:1 Ethyl oleate	12% Wt.
18:2 Ethyl linoleate	3% Wt.

Ethyl Esters in Beef Tallow

BF-BT-EE	100 mg
14:0 Ethyl myristate	2% Wt.
16:0 Ethyl palmitate	30% Wt.
16:1 Ethyl palmitoleate	3% Wt.
18:0 Ethyl stearate	14% Wt.
18:1 Ethyl oleate	41% Wt.
18:2 Ethyl linoleate	7% Wt.
18:3 Ethyl linolenate	3% Wt.



A field of rapeseed

FAEEs Compounds

Neats (100 mg) Solutions (10 mg/mL conc. in Hexane)

Compound	Cat. No.	Unit
Ethyl palmitate (16:0)	FAEE-006N	100 mg
	FAEE-006S	1 mL
Ethyl stearate (18:0)	FAEE-007N	100 mg
	FAEE-007S	1 mL
Ethyl arachidate (20:0)	FAEE-008N	100 mg
	FAEE-008S	1 mL
Ethyl oleate (18:1)	FAEE-014N	100 mg
	FAEE-014S	1 mL
Ethyl linoleate (18:2)	FAEE-012N	100 mg
	FAEE-012S	1 mL
Ethyl linolenate (18:3)	FAEE-016N	100 mg
	FAEE-016S	1 mL
Ethyl myristate (14:0)	FAEE-005N	100 mg
	FAEE-005S	1 mL
Ethyl behenate (22:0)	FAEE-009N	100 mg
	FAEE-009S	1 mL
Ethyl lignocerate (24:0)	FAEE-010N	100 mg
	FAEE-010S	1 mL
Ethyl erucate (22:1)	FAEE-011N	100 mg
	FAEE-011S	1 mL
Ethyl caprylate (8:0)	FAEE-002N	100 mg
	FAEE-002S	1 mL
Ethyl caprate (10:0)	FAEE-003N	100 mg
	FAEE-003S	1 mL
Ethyl laurate (12:0)	FAEE-004N	100 mg
	FAEE-004S	1 mL
Ethyl palmitoleate (16:1)	FAEE-001N	100 mg
	FAEE-001S	1 mL
Ethyl nervonate (24:1)	FAEE-013N	100 mg
	FAEE-013S	1 mL
Ethyl heptadecanoate (17:0)	FAEE-015N	100 mg
	FAEE-015S	1 mL
Ethyl linolenate (gamma) (18:3)	FAEE-020N	100 mg
	FAEE-020S	1 mL

EN15721 Ethanol Impurities

Ethanol Impurities

Solution A

EN-15721-A

1% w/w each in Ethanol

Methanol	2-Butanol
Acetaldehyde	1-Butanol
3-Methyl-1-butanol	1-Propanol
2-Methyl-1-butanol	Ethyl acetate
2-Methyl-1-propanol	Acetal

Internal Standard

Solution A

EN-15721-A-IS

1% w/w in Ethanol

3-Propanol

1 mL

EN15721 Solution A Set

EN-15721-A-SET

2 x 1 mL

EN-15721-A and EN-15721-A-IS



IP391/07 Aromatic Hydrocarbon/FAME Test Method for Diesel and Petro/Biodiesel

NEW

IP-391/07-01

At stated ($\mu\text{g/mL}$) conc. in *n*-Heptane

5 mL

7 comps.

Cyclohexane	10,000
Dodecylbenzene	1,000
o-Xylene	5,000
Hexamethylbenzene	1,000
Naphthalene	1,000
Dibenzothiophene	500
9-Methylanthracene	500

IP-391/07-02

At stated ($\mu\text{g/mL}$) conc. in *n*-Heptane

5 mL

6 comps.

Palmitic acid methyl ester	800
Stearic acid methyl ester	800
Methyl cis-9-octadecenoate	800
Linoleic acid methyl ester	800
Chrysene	400
Linolenic acid methyl ester	800

Test Method Set

IP-391/07-SET

2 x 5 mL

IP-391/07-01

IP-391/07-02

EN12916 Hydrocarbons in Biofuel

NEW

EN-12916-SET

At stated (mg/mL) conc. in Heptane

4 x 1 mL

3 comps.

	EN-12916-01	EN-12916-02	EN-12916-03	EN-12916-04
1,2-Dimethylbenzene	40	10	2.5	0.5
Fluorene	20	10	2.5	0.2
Phenanthrene	4.0	2.0	0.5	0.1

Physical Standards

Compound	Conc.	Matrix	Cat. No.	Unit
ASTM D2500				
Cloud Point	-16 °C *	B5	BF-D-2500-B5-250ML	250 mL
	-14 °C *	B20	BF-D-2500-B20-250ML	250 mL
	-1 °C *	B100	BF-D-2500-B100-250ML	250 mL
ASTM D93 / EN ISO 3679				
Flash Point	60 °C *		BF-D-93-60C-250ML	250 mL
	65 °C *		BF-D-93-65C-250ML	250 mL
	140 °C *		BF-D-93-140C-250ML	250 mL
ASTM D4951 / EN14107				
Phosphorus Content	0.001 % Wt.	B100	BF-D-4951-B100	100 g
ASTM D6304 / EN ISO 12937				
(KF) Water Content	60 $\mu\text{g/g}$	Anisole	BF-KF-0.6X-5ML-VAP	10 x 5 mL
	100 $\mu\text{g/g}$	Anisole	BF-KF-1X-5ML-VAP	10 x 5 mL
	1000 $\mu\text{g/g}$	Anisole	BF-KF-10X-5ML-VAP	10 x 5 mL
	5000 $\mu\text{g/g}$	Anisole	BF-KF-50X-5ML-VAP	10 x 5 mL
ASTM D6751 / UOP 391 / EN14108 / EN14109				
Sodium / Potassium	100 ppm	B100	BF-UOP-391-B100	100 g
EN 14538				
Calcium / Magnesium	100 ppm	B100	BF-14538-B100	100 g



Cloud Point

* These are nominal values and the actual value will be recorded on the certificate.

ASTM D6751 & ASTM D5453 Sulfur as Di-n-butyl sulfide in Biodiesel

Sulfur in Biodiesel 5%

ppm (µg/g)	% Wt.	Cat. No.	Unit
0	0	BF-5453-B5-BL	100 mL
5	0.0005	BF-5453-B5-5X-SET	2 x 100 mL
10	0.001	BF-5453-B5-10X-SET	2 x 100 mL
15	0.0015	BF-5453-B5-15X-SET	2 x 100 mL
30	0.003	BF-5453-B5-30X	100 mL
50	0.005	BF-5453-B5-50X	100 mL
75	0.0075	BF-5453-B5-75X	100 mL
100	0.01	BF-5453-B5-100X	100 mL
200	0.02	BF-5453-B5-200X	100 mL
500	0.05	BF-5453-B5-500X	100 mL

Sulfur in Biodiesel 100%

ppm (µg/g)	% Wt.	Cat. No.	Unit
0	0	BF-5453-B100-BL	100 mL
5	0.0005	BF-5453-B100-5X-SET	2 x 100 mL
10	0.001	BF-5453-B100-10X-SET	2 x 100 mL
15	0.0015	BF-5453-B100-15X-SET	2 x 100 mL
30	0.003	BF-5453-B100-30X	100 mL
50	0.005	BF-5453-B100-50X	100 mL
75	0.0075	BF-5453-B100-75X	100 mL
100	0.01	BF-5453-B100-100X	100 mL
200	0.02	BF-5453-B100-200X	100 mL
500	0.05	BF-5453-B100-500X	100 mL

Sulfur in Biodiesel 20%

ppm (µg/g)	% Wt.	Cat. No.	Unit
0	0	BF-5453-B20-BL	100 mL
5	0.0005	BF-5453-B20-5X-SET	2 x 100 mL
10	0.001	BF-5453-B20-10X-SET	2 x 100 mL
15	0.0015	BF-5453-B20-15X-SET	2 x 100 mL
30	0.003	BF-5453-B20-30X	100 mL
50	0.005	BF-5453-B20-50X	100 mL
75	0.0075	BF-5453-B20-75X	100 mL
100	0.01	BF-5453-B20-100X	100 mL
200	0.02	BF-5453-B20-200X	100 mL
500	0.05	BF-5453-B20-500X	100 mL

Note: 10,000 ppm = 1% Wt.

Biofuel Blank

B100

BF-WM-B100-BL-1	100 g
BF-WM-B100-BL-5	500 g

Technical Note

The 5, 10 and 15 ppm sulfurs are supplied as a set including a blank. We suggest using the blank for analysis to compensate for matrix interferences, such as low levels of native sulfur.

EN14214 Wear Metals

Each is 100 grams at 500 µg/g concentration.

Compound	Matrix	Cat. No.	100 grams
Aluminum	B100	BF-WM-B100-01-0.5X	
Calcium	B100	BF-WM-B100-09-0.5X	
Chromium	B100	BF-WM-B100-13-0.5X	
Copper	B100	BF-WM-B100-15-0.5X	
Iron	B100	BF-WM-B100-27-0.5X	
Lead	B100	BF-WM-B100-29-0.5X	
Magnesium	B100	BF-WM-B100-32-0.5X	
Phosphorus	B100	BF-WM-B100-41-0.5X	
Potassium	B100	BF-WM-B100-43-0.5X	
Sodium	B100	BF-WM-B100-54-0.5X	
Zinc	B100	BF-WM-B100-70-0.5X	

Biofuel Metals Mix

Multi-Element Biofuel Standard

BF-WM-B100-MIX 100 g
200 µg/g each in B100 5 comps.

Ca (Calcium)	Na (Sodium)
K (Potassium)	P (Phosphorus)
Mg (Magnesium)	

Custom Formulations

Available upon request.

Please contact us



AccuStandard[®]

ISO Guide 34:2009 • ISO/IEC 17025:2005 • ISO 9001:2008

www.AccuStandard.com



**CHROMATOGRAPHIC
SPECIALTIES INC.**

1-800-267-8103 • www.chromspec.com • tech@chromspec.com

