Biofuel Standards

AccuStandard®

CHROMATOGRAPHIC SPECIALTIES INC.

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Biofuel Analysis

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.

Product Highlights:

- Physical properties such as viscosity, cloud 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, IP391/07 and IP585

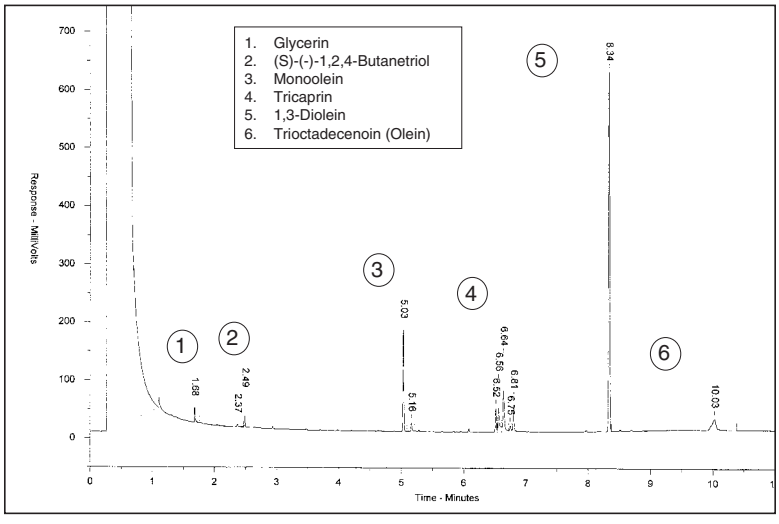
Refinery and Consumer Grade Biofuels

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 (Refinery grade)	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
				BF-D-6584-SET	**7 units**

Mix of above compounds, on right (MSTFA separate)



ASTM D6584 Mixture

BF-D-6584-MIX **5 mL**

At stated conc.(mg/mL) in Pyridine

	6 comps.
Glycerol	0.5
Monoolein	5
1,3-Diolein	5
Trioctadecenoin (Olein)	5
(S)-(-)-1,2,4-Butanetriol	1
Tricaprin	8

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

ASTM Standard D6584 SET (without IS)

GLYC-FT-SET **5 x 1 mL**

At stated conc. (µg/mL) in Pyridine 4 comps.

Level	1	2	3	4	5
GLYC-FT	-01	-02	-03	-04	-05
1,3-Diolein	50	100	200	350	500
Triolein	50	100	200	350	500
Glycerol	5	15	25	35	50
Monoolein	100	250	500	750	1000

Solution I

EN-14105-01 **1 mL**

At stated conc. (µg/mL) in Pyridine

	6 comps.
(s)-(-)-1,2,4-Butanetriol	80
Monoolein	250
Diolein	50
Triolein	50
Glycerol	5
Tricaprin	800

Solution II

EN-14105-02 **1 mL**

At stated conc. (µg/mL) 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 conc. (µg/mL) 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 conc. (µg/mL) in Pyridine

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

Biofuel Analysis

EN14103 Fatty Acid Methyl Esters (FAMEs)

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

Soy and Corn

BF-SOY-ME **100 mg**
At stated Wt.% 6 comps.

16:0 Methyl palmitate	6
18:0 Methyl stearate	3
20:0 Methyl arachidate	3
18:1 Methyl oleate	35
18:2 Methyl linoleate	50
18:3 Methyl linolenate	3

Beef Tallow and Palm Oil

BF-BT-ME **100 mg**
At stated Wt.% 7 comps.

14:0 Methyl myristate	2
16:0 Methyl palmitate	30
16:1 Methyl palmitoleate	3
18:0 Methyl stearate	14
18:1 Methyl oleate	41
18:2 Methyl linoleate	7
18:3 Methyl linolenate	3

Palm Kernel

BF-PALM-ME **100 mg**
At stated Wt.% 8 comps.

8:0 Methyl paprylate	7
10:0 Methyl caprate	5
12:0 Methyl laurate	48
14:0 Methyl myristate	15
16:0 Methyl palmitate	7
18:0 Methyl stearate	3
18:1 Methyl oleate	12
18:2 Methyl linoleate	3

Percent Methanol Calibration Standard Set (EN14110)

BF-MEOH-SET **5 x 1 mL**
At stated conc. (µg/g)

BF-MEOH-1X	100	BF-MEOH-25X	2500
BF-MEOH-5X	500	BF-MEOH-50X	5000
BF-MEOH-10X	1000		

Methanol in water

Rapeseed Oil

BF-RAP-ME **100 mg**
At stated Wt.% 11 comps.

14:0 Methyl myristate	1
16:0 Methyl palmitate	4
18:0 Methyl stearate	3
20:0 Methyl arachidate	3
22:0 Methyl behenate	3
24:0 Methyl lignocerate	3
18:1 Methyl oleate	60
22:1 Methyl erucate	5
18:2 Methyl linoleate	12
18:3 Methyl linolenate	5
20:1 Methyl eicosenoate	1

Technical Note

Individual mixes packaged under nitrogen for stability.

IP585 Fatty Acid Methyl Esters (FAMEs) in Aviation Turbine Fuel

FAME in Aviation Turbine Fuel

IP-585-BCS **1 mL**
1000 µg/g each in n-Dodecane 6 comps.

Methyl palmitate
Methyl heptadecanoate
Methyl stearate
Methyl oleate
Methyl linoleate
Methyl linolenate

Internal Standard

IP-585-IS **1 mL**
1000 µg/g in n-Dodecane

Methyl heptadecanoate-d_{33}

EN15779 Polyunsaturated Fatty Acid Methyl Esters (PUFAMEs)

PUFAMEs

EN-15779-R1 **1 mL**
0.25% w/v in n-Heptane 4 comps.

cis-4,7,10,13,16,19-Docosahexaenoic acid methyl ester
cis-7,10,13,16,19-Docosapentaenoic acid methyl ester
Arachidonic acid methyl ester
Eicosapentaenoic acid methyl ester

Internal Standard

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

Methyl tricosanoate

Biofuel Analysis

Fatty Acid Ethyl Esters (FAEEs)

Ethyl Esters in Soy & Corn

BF-SOY-EE **100 mg**
At stated Wt.% 6 comps.

16:0 Ethyl palmitate	6
18:0 Ethyl stearate	3
20:0 Ethyl arachidate	3
18:1 Ethyl oleate	35
18:2 Ethyl linoleate	50
18:3 Ethyl linolenate	3

Ethyl Esters in Rapeseed Oil

BF-RAP-EE **100 mg**
At stated Wt.% 10 comps.

14:0 Ethyl myristate	1
16:0 Ethyl palmitate	4
18:0 Ethyl stearate	3
20:0 Ethyl arachidate	3
22:0 Ethyl behenate	3
24:0 Ethyl lignocerate	3
18:1 Ethyl oleate	45
22:1 Ethyl erucate	20
18:2 Ethyl linoleate	15
18:3 Ethyl linolenate	3

Ethyl Esters in Palm Kernel Oil

BF-PALM-EE **100 mg**
At stated Wt.% 8 comps.

8:0 Ethyl caprylate	7
10:0 Ethyl caprate	5
12:0 Ethyl laurate	48
14:0 Ethyl myristate	15
16:0 Ethyl palmitate	7
18:0 Ethyl stearate	3
18:1 Ethyl oleate	12
18:2 Ethyl linoleate	3

Ethyl Esters in Beef Tallow

BF-BT-EE **100 mg**
At stated Wt.% 7 comps.

14:0 Ethyl myristate	2
16:0 Ethyl palmitate	30
16:1 Ethyl palmitoleate	3
18:0 Ethyl stearate	14
18:1 Ethyl oleate	41
18:2 Ethyl linoleate	7
18:3 Ethyl linolenate	3

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
[illegible]	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

AccuStandard is an ISO accredited Reference Material Producer

EN15721 Ethanol Impurities

Ethanol Impurities Solution A

EN-15721-A **1 mL**
1 Wt.% each in Ethanol 10 comps.

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

Internal Standard Solution A

EN-15721-A-IS **1 mL**
1 Wt.% in Ethanol

3-Propanol

EN15721 Solution A Set

EN-15721-A-SET **2 x 1 mL**

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

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

IP-391-07-01 **5 mL**
At stated conc. (µg/mL) in n-Heptane 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 **5 mL**
At stated conc. (µg/mL) in n-Heptane 6 comps.

Methyl palmitate	800
Methyl stearate	800
Methyl cis-9-octadecenoate	800
Methyl linoleate	800
Chrysene	400
Methyl linolenate	800

IP391/07 Test Method Set

IP-391-07-SET **$ 225 / 2 x 5 mL**

IP-391-07-01
IP-391-07-02

EN12916 Hydrocarbons in Biofuel

EN-12916-SET **4 x 1 mL**
At stated conc. (mg/mL) in Heptane 3 comps.

	EN-12916-01	EN-12916-02	EN-12916-03	EN-12916-04
o-Xylene (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

Biofuel Analysis

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 / EN 14107					
Phosphorus Content	10	µg/g *	B100	BF-D-4951-B100	100 g
ASTM D6304 / EN ISO 12937					
(KF) Water Content	60	µg/g *	Anisole	BF-KF-0.6X-5ML-VAP	10 x 5 mL
	100	µg/g *	Anisole	BF-KF-1X-5ML-VAP	10 x 5 mL
	1000	µg/g *	Anisole	BF-KF-10X-5ML-VAP	10 x 5 mL
	5000	µg/g *	Anisole	BF-KF-50X-5ML-VAP	10 x 5 mL
ASTM D6751 / UOP 391 / EN14108 / EN14109					
Sodium / Potassium	100	µg/g *	B100	BF-UOP-391-B100	100 g
EN 14538					
Calcium / Magnesium	100	µg/g *	B100	BF-14538-B100	100 g

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

Cloud Point Tester

▲ Hazardous fee required for air shipments.

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.

▲ Hazardous fee required for air shipments.

EN14214 Wear Metals

Each is 100 grams at 500 µg/g concentration.

Compound	Matrix	Cat. No.	Units
Aluminum (Al)	B100	BF-WM-B100-01-0.5X	100 grams
Calcium (Ca)	B100	BF-WM-B100-09-0.5X	100 grams
Chromium (Cr)	B100	BF-WM-B100-13-0.5X	100 grams
Copper (Cu)	B100	BF-WM-B100-15-0.5X	2 100 grams
Iron (Fe)	B100	BF-WM-B100-27-0.5X	100 grams
Lead (Pb)	B100	BF-WM-B100-29-0.5X	100 grams
Magnesium (Mg)	B100	BF-WM-B100-32-0.5X	100 grams
Phosphorus (P)	B100	BF-WM-B100-41-0.5X	100 grams
Potassium (K)	B100	BF-WM-B100-43-0.5X	100 grams
Sodium (Na)	B100	BF-WM-B100-54-0.5X	100 grams
Zinc (Zn)	B100	BF-WM-B100-70-0.5X	100 grams

Biofuel Metals Mix

Multi-Element Biofuel Standard

BF-WM-B100-MIX **100 g**

200 µg/g each in B100 5 comps.

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

Custom Formulations
Available upon request
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