Certified Reference Standards

BioFuels

FAME Mixtures

Sulfur Standards

Physical Standards

Wear Metals

ASTM & EN Method Standards

Custom Formulations

BioFuels

AccuStandard

ASTM D 6584 & EN 14105 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	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**
Biofuel 20	0.5	mg/mL	CH_2Cl_2	BF-FU-030-D	2 mL
Biofuel 20	20	mg/mL	CH_2Cl_2	BF-FU-030-D-40X	2 mL
Biofuel 100 Consumer grade	0.5	mg/mL	CH_2Cl_2	BF-FU-029-D	2 mL
Biofuel 100 Consumer grade	20	mg/mL	CH_2Cl_2	BF-FU-029-40X	2 mL
Biofuel 100	0.5	mg/mL	CH_2Cl_2	BF-FU-032-D	2 mL
Biofuel 100	20	mg/mL	CH_2Cl_2	BF-FU-032-D-40X	2 mL

EN 14103 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	%
18 :0 Stearate	3	%
20 :0 Arachidate	3	%
18 :1 Oleate	35	%
18 :2 Linoleate	50	%
18 :3 Linolenate	3	%

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	45	% Wt.
22 :1 Eurcate	20	% Wt.
18 :2 Linoleate	15	% Wt.
18 :3 Linolenate	3	% 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.
18 :0 Stearate	14	% Wt
16 :1 Palmitoleate	3	% Wt.
18 :1 Oleate	41	% Wt.
18 :2 Linoleate	7	% Wt.
18 :3 Linolenate	3	% Wt.

Full Circle
"Liquid biofuels have been used since the early days of the car industry. Nikolaus August Otto, the German inventor of the combustion engine, conceived his invention to run on ethanol. Rudolf Diesel, the German inventor of the Diesel engine, designed it to run on peanut oil. Henry Ford originally designed the Ford Model T, a car produced from 1903 to 1926, to run completely on ethanol." (source: http://en.wikipedia.org/wiki/Biofuel Retrieved 8/31/2007).

ASTM D 6751-06 & ASTM D 5453 Sulfur as Di-n-butyl sulfide in Biodiesel

COMPOUND	% WT.		MATRIX	CAT. NO.	UNIT
Sulfur in B5	0	% WT	B5	BF-D-5453-B5-BL	4 oz.
Sulfur in B5	0.0005	% WT	B5	BF-D-5453-B5-5X	4 oz.
Sulfur in B5	0.001	% WT	B5	BF-D-5453-B5-10X	4 oz.
Sulfur in B5	0.0015	% WT	B5	BF-D-5453-B5-15X	4 oz.
Sulfur in B5	0.003	% WT	B5	BF-D-5453-B5-30X	4 oz.
Sulfur in B5	0.005	% WT	B5	BF-D-5453-B5-50X	4 oz.
Sulfur in B5	0.007	% WT	B5	BF-D-5453-B5-75X	4 oz.
Sulfur in B5	0.01	% WT	B5	BF-D-5453-B5-100X	4 oz.
Sulfur in B5	0.02	% WT	B5	BF-D-5453-B5-200X	4 oz.
Sulfur in B5	0.05	% WT	B5	BF-D-5453-B5-500X	4 oz.
Sulfur in B20	0	% WT	B20	BF-D-5453-B20-BL	4 oz.
Sulfur in B20	0.0005	% WT	B20	BF-D-5453-B20-5X	4 oz.
Sulfur in B20	0.001	% WT	B20	BF-D-5453-B20-10X	4 oz.
Sulfur in B20	0.0015	% WT	B20	BF-D-5453-B20-15X	4 oz.
Sulfur in B20	0.003	% WT	B20	BF-D-5453-B20-30X	4 oz.
Sulfur in B20	0.005	% WT	B20	BF-D-5453-B20-50X	4 oz.
Sulfur in B20	0.007	% WT	B20	BF-D-5453-B20-75X	4 oz.
Sulfur in B20	0.01	% WT	B20	BF-D-5453-B20-100X	4 oz.
Sulfur in B20	0.02	% WT	B20	BF-D-5453-B20-200X	4 oz.
Sulfur in B20	0.05	% WT	B20	BF-D-5453-B20-500X	4 oz.
Sulfur in B100	0	% WT	B100	BF-D-5453-B100-BL	4 oz.
Sulfur in B100	0.0005	% WT	B100	BF-D-5453-B100-5X	4 oz.
Sulfur in B100	0.001	% WT	B100	BF-D-5453-B100-10X	4 oz.
Sulfur in B100	0.0015	% WT	B100	BF-D-5453-B100-15X	4 oz.
Sulfur in B100	0.003	% WT	B100	BF-D-5453-B100-30X	4 oz.
Sulfur in B100	0.005	% WT	B100	BF-D-5453-B100-50X	4 oz.
Sulfur in B100	0.007	% WT	B100	BF-D-5453-B100-75X	4 oz.
Sulfur in B100	0.01	% WT	B100	BF-D-5453-B100-100X	4 oz.
Sulfur in B100	0.02	% WT	B100	BF-D-5453-B100-200X	4 oz.
Sulfur in B100	0.05	% WT	B100	BF-D-5453-B100-500X	4 oz.

Note: All products are refinery grade stock, unless specifically marked Consumer grade.

Physical Standards

COMPOUND	CONC.		MATRIX	CAT. NO.	UNIT
ASTM D 2500					
Cloud Point	TBD *	ºC	B5	BF-D-2500-B5	8 oz.
Cloud Point	TBD *	ºC	B20	BF-D-2500-B20	8 oz.
Cloud Point	TBD *	ºC	B100	BF-D-2500-B100	8 oz.
ASTM D 93					
Flash Point	TBD *	ºC	B5	BF-D-93-B5	8 oz.
Flash Point	TBD *	ºC	B20	BF-D-93-B20	8 oz.
Flash Point	TBD *	ºC	B100	BF-D-93-B100	8 oz.
ASTM D 4951					
Phosphorus Content	0.001	% Wt.	B5	BF-D-4951-B5	50 g
Phosphorus Content	0.001	% Wt.	B20	BF-D-4951-B20	50 g
Phosphorus Content	0.001	% Wt.	B100	BF-D-4951-B100	50 g
EN ISO 12937 & ASTM D 6304					
(KF) Water Content	60	µg/g		BF-KF-0.6X-5ML-VAP	5 mL
(KF) Water Content	100	µg/g		BF-KF-1X-5ML-VAP	5 mL
(KF) Water Content	1000	µg/g		BF-KF-10X-5ML-VAP	5 mL
(KF) Water Content	5000	µg/g		BF-KF-50X-5ML-VAP	5 mL
ASTM D 6751 & UOP 391 & EN 14108 & EN 14109					
Sodium / Potassium	100	ppm	B5	BF-UOP-391-B5	50 g
Sodium / Potassium	100	ppm	B20	BF-UOP-391-B20	50 g
Sodium / Potassium	100	ppm	B100	BF-UOP-391-B100	50 g
EN 14538					
Calcium / Magnesium	100	ppm	B5	BF-14538-B5	50 g
Calcium / Magnesium	100	ppm	B20	BF-14538-B20	50 g
Calcium / Magnesium	100	ppm	B100	BF-14538-B100	50 g

* TBD - These values will be certified on the individual lots and may vary between lots.

The Future
Algae, as a biofuel feedstock, yields energy balances higher than even soybeans. (source: "Widescale Biodiesel Production from Algae", Briggs, Michael, University of New Hampshire Biodiesel Group, UNH (revised August 2004) page 8.

EN 14214 Wear Metals

COMPOUND	CONC.		MATRIX	CAT. NO.	UNIT
Aluminum in B5	1000	µg/g	B5	BF-WM-B5-01	50 g
Aluminum in B20	1000	µg/g	B20	BF-WM-B20-01	50 g
Aluminum in B100	1000	µg/g	B100	BF-WM-B100-01	50 g
Chromium in B5	1000	µg/g	B5	BF-WM-B5-13	50 g
Chromium in B20	1000	µg/g	B20	BF-WM-B20-13	50 g
Chromium in B100	1000	µg/g	B100	BF-WM-B100-13	50 g
Copper in B5	1000	µg/g	B5	BF-WM-B5-15	50 g
Copper in B20	1000	µg/g	B20	BF-WM-B20-15	50 g
Copper in B100	1000	µg/g	B100	BF-WM-B100-15	50 g
Iron in B5	1000	µg/g	B5	BF-WM-B5-27	50 g
Iron in B20	1000	µg/g	B20	BF-WM-B20-27	50 g
Iron in B100	1000	µg/g	B100	BF-WM-B100-27	50 g
Lead in B5	1000	µg/g	B5	BF-WM-B5-29	50 g
Lead in B20	1000	µg/g	B20	BF-WM-B20-29	50 g
Lead in B100	1000	µg/g	B100	BF-WM-B100-29	50 g
Silicon in B5	1000	µg/g	B5	BF-WM-B5-52	50 g
Silicon in B20	1000	µg/g	B20	BF-WM-B20-52	50 g
Silicon in B100	1000	µg/g	B100	BF-WM-B100-52	50 g

Formulations for EN 12916 and other methods are available as well as custom formulations.

Discussions

■ Food-or-fuel is the subject of current discussions. Since corn and soy are used as both food sources as well as biofuels stocks, high biofuels demand raises food prices throughout the grocery store.

■ Biofuel production is not completely carbon neutral today, since fossil fuel generated energy is consumed to grow and process the crops for biofuels and in their transportation to market. The Life Cycle Analysis (LCA) for biofuels has shown that even the current biofuels save up to 60% of carbon emissions as compared to using petroleum fuels[1].

■ Biofuels have negative environmental impacts as well. Pesticides are usually used to grow the more common biomasses. The run-off of pesticides from farmlands is a great concern to aquatic ecosystems.

■ Genetically engineered (GE) biofuel crops may not need as many pesticides, but raises another issue this introduces an additional issue, the concern of some people about the proliferation of GE crops.

■ Other concerns are that growers may destroy ecological treasures in their zeal to meet the burgeoning demand for the biomasses. Cutting down the Amazon rain forest to plant soy or deforesting the Malaysian rain forest and draining peat bogs in Indonesia to establish new palm oil plantations are such current concerns. The concerns go beyond the aesthetic. When a forest is converted to farmland animal habitat and biodiversity are lost. Large amounts of CO_2 are released to the atmosphere when peat bogs are drained.

■ The world's infrastructure is not ready today to completely replace petroleum, or to fully implement the possibilities of biofuels. The biofuels production plants are barely more than pilot plants today, certainly not on the scale of the mega petroleum refineries. Few engines are currently designed to accept 100% biofuel. Biofuels stations are not readily available in most parts of the world.

■ When habitable land is converted to farmland, indigenous people may be dispossessed.

■ The technology of biofuels is in the development stage. The biomasses named in the current media are categorized as first generation biofuels. Second generation biofuels use biomass to liquid technology, and include technologies such as:

* Bio generated hydrogen
* Bio generated di-methyl ether
* Bio generated methanol
* Bio generated DMF
* HTU diesel, diesel produced from wet bio-mass
* Diesel produced by Fischer-Tropsch technology
* Methanol processed from syngas

The LCA studies for these second-generation biofuels shows that biofuels can save up to 1/3 more carbon emissions than first generation biofuels as compared to LCA carbon emissions of petroleum based fuels[2].

Footnotes:
1. Concawe European WTW study (http://ies.jrc.ec.eu.int/wtw.html) Section 5.
2. "Life Cycle Inventory of Biodiesel and Petroleum Diesel for use in an Urban Bus," Final Report, Sheeham, John, et al. Prepared for U.S. Department of Energy. Pages 220-222.

AccuStandard Europe

Standards are our Life

Dr. Vogel GmbH Walliswilweg 2 CH-4704 Niederbip
www.vogel-gmbh.ch Tel.: +41-32-633-0018 Fax: +41-32-633-2802