

TRADE STANDARDS AND QUALITY CONTROL DECREE 1992
(DECREE NO. 24 OF 1992)

**Trade Standards (Fuel Standards) National Biodiesel
and Ethanol Fuel Standards (Amendment) Order
2011**

IN exercise of the powers conferred upon me by section 26 of the Trade Standards and Quality Control Decree 1992, and after considering the recommendation of the Council and that it is in the public interest to designate trade standards for biodiesel and ethanol fuel, I hereby amend Legal Notice No. 59 of 2007 and make this Order—

Citation and commencement

1. This Order may be cited as the Trade Standards (Fuel Standards) (Amendment) (Biodiesel and Ethanol Fuel Standards) Order 2011 and comes into force on 1st October, 2011.

Paragraph 2 amended

2. Paragraph 2 of the Trade Standards (Fuel Standards) Order 2007 (Legal Notice No. 59) is amended by adding the following—

- (a) a new subparagraph (6) - “Diesel may contain 5% by volume (max.) biodiesel (FAME). The 5% biodiesel should however conform to the biodiesel, B100 standards prior to blending”.
- (b) in Schedule 1 of subparagraph 4 (1) by adding “ or European Standards (EN)” before the words “testing method...”.

- (c) in Schedule 1 of Table 2 by adding item (7) column 2 “ Biodiesel (FAME) column 3 EN14078”.

Paragraph 4 inserted

3. A new Paragraph 4 is inserted as follows—

“Trade Standards for Biodiesel Fuel

4. The Trade Standards for biodiesel fuel are set out in Schedule 3”.

Paragraph 5 inserted

4. A new Paragraph 5 is inserted as follows—

“Trade Standards for Ethanol Fuel

4. The Trade Standards for ethanol fuel are set out in Schedule 4”.

Dated this 9th day of August 2011.

AIYAZ SAYED-KHAIYUM
Attorney-General & Minister
for Justice, Anti-Corruption, Public Enterprises,
Communications, Civil Aviation, Tourism, Industry & Trade

SCHEDULE 3
(*paragraph 4*)

TRADE STANDARDS FOR BIODIESEL FUEL

1.0 Application

These Trade Standards (herein referred to as “Standards”) apply to biodiesel produced, imported, sold or used in Fiji or exported to other countries.

2.0 Definition

In these Standards, unless the context otherwise requires—

“biodiesel” means any fuel comprised of mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats, and meeting the requirements of ASTM D6751.

“Director” means the Director of Standards and Quality Control appointed under section 14 of the Decree;

“Officer” means a person appointed as such pursuant to the Decree;

3.0 Standards for Biodiesel

Biodiesel must meet the requirements as set out in Table 1.

TABLE 1: BIODIESEL REQUIREMENTS

Item	Property	Value
1	Ester Content	96.5 (min)
2	Oxidation Stability: Induction Period	6 hrs (min)
3	Total Acid Number	0.50 mg KOH/g (max)
4	Methanol ⁽¹⁾	0.20 % m/m (max)
5	Glycerides	
	Mono-glycerides	0.80 % m/m (max)
	Di-glycerides	0.20 % m/m (max)
	Tri-glycerides	0.20 % m/m (max)
6	Glycerin (glycerol)	
	Free glycerin	0.02 % m/m (max)
	Total glycerin	0.25 % m/m (max)
7	Density@ 15°C	860-890 kg/m ³
8	Kinematic viscosity @ 40 °C	3.5-5.0 mm ² /s
9	Flash Point	100 °C (min)
10	Cetane Number	51 (min)
11	Cetane Index ⁽²⁾	48 (min)
12	Water	500 mg/kg (max)
13	Water and Sediment	0.05 % v/v (max)
14	Total Contamination	24 mg/kg (max)
15	Ash Content	0.01 % m/m (max)
16	Sulphated Ash	0.02 % m/m (max)
17	Carbon residue [Ramsbottom, on 100% distillation residue]	0.05 % m/m (max)
18	Sulphur	50 mg/kg (max) [50ppm]
19	Phosphorus	4 mg/kg (max) [4ppm]
20	Alkali metals (Na + K)	5 mg/kg(max)
21	Alkaline metals (Ca +Mg)	5 mg/kg (max)
22	Distillation T90	360 °C (max)
23	Copper Strip Corrosion	No. 3 (max)

⁽¹⁾ If methanol content is above this maximum level this specification may still be met if the flash point meets a minimum of 130 °C.

⁽²⁾ For calculation of cetane index, temperature readings for 10 vol. %, 50 vol. % and 90 vol. % are required.

Note: These standards are based on engine and vehicle manufacturers experience with biodiesel fuels made from feed stocks commonly used today in various markets around the world. These standards are performance based and feed stock neutral.

4.0 Sampling, Methods and Record Keeping

4.1 Testing Methods

To determine the amount of a substance mentioned in Table 1 that is contained in biodiesel, or a parameter mentioned in Table 1 for biodiesel, an American Society for Testing and Materials (ASTM) or European Standard (EN) testing methods mentioned in Table 2 for the substance or parameter must be used.

TABLE 2: TESTING METHODS

Item	Property	Test Method
1	Ester Content	EN 14103 modified
2	Oxidation Stability: Induction Period	prEN 15751 or EN 14112
3	Total Acid Number	ASTM D664
4	Methanol	EN 14110
5	Glycerides Mono-glycerides Di-glycerides Tri-glycerides	ASTM D6584
6	Glycerin (glycerol) Free glycerin Total glycerin	ASTM D6584
7	Density@ 15°C	ASTM D4052
8	Kinematic viscosity @ 40 °C	ASTM D445
9	Flash Point	ASTM D93
10	Cetane Number	ASTM D613
11	Cetane Index	ASTM D976 / D4737
12	Water	EN 12937
13	Water and Sediment	ASTM D2709
14	Total Contamination	ASTM D2276
15	Ash Content	ASTM D482
16	Sulphated Ash	ASTM D874
17	Carbon residue [Ramsbottom, on 100% distillation residue]	ASTM D4530
18	Sulphur	ASTM D2622
19	Phosphorus	ASTM D4951
20	Alkali metals (Na + K)	EN 14108/14109
21	Alkaline metals (Ca +Mg)	EN 14538
22	Distillation T90	ASTM D1160
23	Copper Strip Corrosion	ASTM D130

4.2 Reporting by Oil Companies or Importers

To allow for consistent monitoring of biodiesel fuel, companies are required to provide test reports following the test methods specified in Table 2 from an accredited laboratory that is approved by the Minister on the recommendations of the Director.

The reports are to be submitted within month end of each quarter and should include tests for properties of substances mentioned in Table 1. Reports to be submitted to:

The Director
Trade Standards and Quality Control Office
Ministry of Industry and Trade
P.O. Box 2118
Government Buildings
Suva

4.3 Taking of Samples

The Director may direct an Officer to take samples at anytime for testing for the purposes of compliance with these standards.

SCHEDULE 4 (paragraph 5)

TRADE STANDARDS FOR ETHANOL FUEL

1.0 Application

These Trade Standards (herein referred to as "Standards") apply to ethanol produced, imported, sold or used in Fiji or exported to other countries.

2.0 Definition

In these Standards, unless the context otherwise requires—

"Ethanol" means any fuel used in the transportation or power sector, excluding ethanol produced for alcoholic beverages;

"Director" means the Director of Standards and Quality Control appointed under section 14 of the Decree;

"Officer" means a person appointed as such pursuant to the Decree;

3.0 Standards for Ethanol

Ethanol must meet the requirements as set out in Table 1.

TABLE 1: ETHANOL STANDARDS

Item	Property	Value
1	Ethanol	99.2 % m/m (min) [prior to denaturing] 94.2 % m/m (min) [after denaturing]
2	Methanol	0.5 % vol. (max)
3	Water	0.7% vol. (max)
4	Density	791.5 kg/m ³ (max)
5	Electrical conductivity ¹	500 μS/m (max)
6	Inorganic chloride	10 mg/L (max)

7	Sulphate	4 mg/kg (max)
8	Copper ²	0.1 mg/kg (max)
9	Phosphorus	0.5 mg/L (max)
10	Sulphur	10 mg/kg (max)
11	Non-volatile material	5 mg/100mL
12	pHe	6.5 - 9
13	Acidity (as acetic acid)	0.007 % m/m (max)
14	Appearance	Clear and bright, no visible impurities
15	Denaturant	1 - 1.5 % vol.

¹ Electrical conductivity correlates closely with the amount of metallic ions such as chloride, sulphate, sodium and iron in the fuel. A higher electrical conductivity means the fuel contains a higher amount of corrosive and metallic ions that promote corrosion and failure in fuel lines and cause injector deposits. The electrical conductivity should be monitored closely and if below the specified value, inorganic chloride and sulphate tests may not necessary be carried out.

² Inductively Coupled Plasma (ICP) spectrometry can be used to measure copper, sodium, iron and phosphorus in one test.

Note: Given the known potential for ethanol to absorb water, suppliers shall ensure that water does not contaminate the ethanol fuel under the expected range of climatic (local humidity levels and temperature) and fuel distribution conditions. The presence of water indicates a need to improve ethanol handling practices, such as by adding a nitrogen seal to the storage tank. Fuel contaminated with water should not be sold to consumers.

4.0 Sampling, Methods and Record Keeping

4.1 Testing Methods

To determine the amount of a substance mentioned in Table 1 that is contained in ethanol, or a parameter mentioned in Table 1 for biodiesel, an American Society for Testing and Materials (ASTM) or European Standard (EN) testing methods mentioned in Table 2 for the substance or parameter must be used.

TABLE 2: TESTING METHODS

Item	Property	Test Method
1	Ethanol	ASTM D5501
2	Methanol	ASTM D5501
3	Water	ASTM E203
4	Density	ASTM D4052
5	Electrical conductivity	ASTM D1125
6	Inorganic chloride	ASTM D7319
7	Sulphate	ASTM D7318
8	Copper	ASTM D1688 modified
9	Phosphorus	ASTM D3231
10	Sulphur	ASTM D5453 ¹ (<20ppm) ASTM D2622 (>20ppm)
11	Non-volatile material	ASTM D381

12	pHe	ASTM D6423
13	Acidity (as acetic acid)	ASTM D1613
14	Appearance	ASTM D4806
15	Denaturant	ASTM D5501

⁽¹⁾ ASTM D5453 is the accepted method for samples containing less than 20 mg/kg (ppm) of sulphur. If it is suspected that samples contain more than 20mg/kg of sulphur ASTM D2622 is to be used.

4.2 Reporting by Oil Companies or Importers

To allow for consistent monitoring of ethanol fuel, companies are required to provide test reports following the test methods specified in Table 2 from an accredited laboratory that is approved by the Minister on the recommendation of the Director. The reports are to be submitted within month end of each quarter and should include tests for properties of substances mentioned in Table 1. Reports to be submitted to:

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4.3 Taking of Samples

The Director may direct an Officer to take samples at anytime for testing for the purposes of compliance with these standards.
