

Biodiesel and ethanol specifications and labelling requirements – final proposals for comment

Proposed Biodiesel Specifications

Biodiesel Specifications

B100 as a final fuel or as a blending component must conform to the parameters set out in the following table:

Property	Unit	Minimum	Maximum	Test Method
Ester content	% mass	96.5	-	EN 14103
Density at 15°C	kg/m ³	860	900	ASTM D 1298
Viscosity at 40°C	mm ² /s	2.00	5.00 ¹	ASTM D 445
Flash point	°C	100	-	ASTM D 93
Sulphur content	mg/kg	-	10.0	IP 497 or ASTM D 5453
Carbon residue (on 100% distillation residue)	% mass	-	0.050	ASTM D 4530
or				
Carbon residue (on 10% distillation residue) ²	% mass	-	0.30	ISO 10370
Cetane number		51.0 ³	-	ASTM D 613
Sulfated ash content	% mass	-	0.02	ASTM D 874
Water content	mg/kg	-	500	ASTM D 6304
Total contamination	mg/kg	-	24.0	IP 440
Copper strip corrosion (3 h at 50°C)	rating	class 1		ASTM D 130
Oxidation stability, 110°C	hours	6.00 ⁴	-	EN 14112
Acid value	mg KOH/g	-	0.50	ASTM D 664
Iodine Value	g iodine/100 g	-	140	EN 14111
Linolenic acid methyl ester	% mass	-	12.0	EN 14103
Methanol content	% mass	-	0.20	EN 14110

¹ Allowable viscosity 6.00 mm²/s maximum when biodiesel used as a blending component with petroleum diesel.

² ASTM D1600 shall be used to obtain the 10% distillation residue.

³ Allowable cetane number 47.0 minimum when biodiesel used as a blending component with petroleum diesel.

⁴ Allowable oxidation stability is 10.0 hours minimum for when biodiesel used as a blending component with petroleum diesel for retail sale.

Monoglyceride content	% mass	-	0.80	ASTM D 6584
Diglyceride content	% mass	-	0.20	ASTM D 6584
Triglyceride content	% mass	-	0.20	ASTM D 6584
Free glycerol	% mass	-	0.02	ASTM D 6584
Total glycerol	% mass	-	0.25	ASTM D 6584
Group I metals (Na+K)	mg/kg	-	5.00	EN 14108 and EN 14109
Group II metals (Ca+Mg)	mg/kg	-	5.00	EN 14538
Phosphorus content	mg/kg	-	10.0	ASTM D 4951

All Biodiesel Blends

All biodiesel blends (retail and non-retail) will need to meet the following specifications included in Schedule 3 of the Petroleum Products Specifications Regulations 2002 (PPSR):

- Cetane Number (51.0 minimum, ASTM D613 or ASTM D6890)
- Colour (3.0 maximum, ASTM D1500)
- Sulphur (50.0 mg/kg maximum, 10.0 mg/kg maximum from 1 January 2009, IP 497 or ASTM D 5453)
- Lubricity (460 µm maximum, IP 450)
- Viscosity (2.0 – 4.5 mm² per second at 40°C, ASTM D445)
- Flash Point (61°C minimum, ASTM D93)
- Total Contamination (24.0 mg/kg maximum, IP 440)

Biodiesel blends that are not intended for retail sale must also meet the following specifications:

- Acid Value: $0.1 + 100 \times X / 250$ mg KOH/g maximum (where X is the percentage by volume of biodiesel in the blend), ASTM D 664
- Water Content: $200 + 300 \times X$ mg/kg maximum (where X is the percentage by volume of biodiesel in the blend), ASTM D 6304

Retail Biodiesel Blends

Biodiesel blends for retail sale will need to meet all of the specifications in Schedule 3 of the PPSR.

It is proposed that the following amendments be made to Schedule 3 of the PPSR:

- Addition of FAME content – 5.0% by volume maximum (to be reviewed indicatively 2010) which must meet the B100 specifications;
- Particulates to change to Total Contamination – test method IP 440 (limit to remain the same at 24 mg/kg);
- Cold flow properties – Summer in Auckland/Northland Cloud Point 6°C maximum;
- Cetane number test method – to include ASTM D 6890 for cetane number and a note that ASTM D 976 is not suitable for biodiesel blends; and
- Density test method to be changed from ASTM D 1298 to ASTM D 4052

Proposed Ethanol Specifications

Ethanol Specifications for Blending

- (1) The ethanol must contain denaturant.
- (2) The ethanol must contain corrosion inhibitor.
- (3) The ethanol must conform to the parameters set out in the following table:

Property	Unit	Limit	Test Method
Ethanol and higher alcohols (C3 - C5)	volume %, min	97.0	ASTM D 5501
Higher alcohols (C3 – C5)	volume %, max	2.0	ASTM D 5501
Methanol	volume %, max	0.5	ASTM D 5501
Denaturant ¹	volume %	1.0 minimum 1.5 maximum	ASTM D 5501
Water content	volume %, max	1.0	ASTM E 203
Solvent-washed gum	mg/100 ml, max	5.0	ASTM D 381
Inorganic Chloride content	mg/L, max	32	ASTM D 512C (as modified in ASTM D 4806)
Copper content	mg/kg, max	0.1	ASTM D 1688A (as modified in ASTM D 4806)
Sulphate	mg/kg, max	4	ASTM D 7318, ASTM D 7319, and ASTM D 7328
Sulphur	mg/kg, max	30	IP 497° or ASTM D 5453
Acidity (as acetic acid CH ₃ COOH)	mass %, max	0.007	ASTM D 1613
pHe		6.5 – 9.0	ASTM D 6423
Appearance		Clear and bright without particles	ASTM D 4806

1. The denaturant contained in ethanol must be unleaded regular grade or premium grade petrol with the following minimum characteristics:
 - i. End point - 210°C maximum
 - ii. Sulphur - 50 mg/kg maximum
 - iii. Clear and bright

Proposed ~~Retail Biodiesel and Ethanol Labelling Requirements~~

~~*Retail Diesel/Biodiesel Blends up to B5*~~

~~All biofuels and biofuel blends not intended for retail sale are not required to be labelled.~~

~~Diesel/biodiesel blends up to 5% by volume biodiesel intended for retail sale do not need to be labelled.~~

Retail Petrol/Ethanol Blends up to E10

All petrol/ethanol blends not for retail sale do not need to be labelled

Petrol/ethanol blends that contain 1% or less ethanol by volume do not need to be labelled as to their ethanol content.

It is proposed that the following labelling requirements apply to retail sales of petrol/ethanol blends that contain over 1% ethanol by volume:

- the maximum percentage of ethanol by volume must be clearly displayed; and
- the words “May not be suitable for all vehicles/engines. Check with the manufacturer before use” must be displayed.

~~Petrol/ethanol blends that contain 1% or less ethanol by volume do not need to be labelled as to their ethanol content.~~