



# Engine Fuel Specifications Amendment Regulations 2017

Patsy Reddy, Governor-General

## Order in Council

At Wellington this 21st day of August 2017

Present:

Her Excellency the Governor-General in Council

These regulations are made under section 35 of the Energy (Fuels, Levies, and References) Act 1989 on the advice and with the consent of the Executive Council.

### Contents

	Page
1 Title	2
2 Commencement	2
3 Principal regulations	2
4 Regulation 5 amended (Interpretation)	2
5 Regulation 8 replaced (Ethanol component of petrol/ethanol blends sold by retail sale)	3
8 Requirements relating to petrol/ethanol blends sold by retail sale	3
8A Requirements relating to petrol/methanol blends sold by retail sale	3
8B Requirements relating to fuel ethanol E85 sold by retail sale	3
6 Regulation 13 amended (Requirements relating to petrol sold by non-retail sale)	4
7 Regulation 14 replaced (Requirements relating to petrol/ethanol blends sold by non-retail sale)	4
14 Requirements relating to petrol/ethanol blends sold by non-retail sale	4

14A	Requirements relating to petrol/methanol blends sold by non-retail sale	4
14B	Requirements relating to fuel ethanol E85 sold by non-retail sale	4
8	Regulation 18 amended (Labelling requirements relating to retail containers and engine fuel pumps)	4
9	Regulation 19 amended (Calculating pool averages)	5
10	Regulation 21 amended (Accreditation)	5
11	Schedule 1 replaced	5
12	Schedule 2 amended	5
13	Schedule 3 replaced	6
14	Schedule 4 amended	6
	<b>Schedule 1</b>	6
	<b>Schedule 1 replaced</b>	
	<b>Schedule 2</b>	9
	<b>Schedule 3 replaced</b>	

## Regulations

**1 Title**

These regulations are the Engine Fuel Specifications Amendment Regulations 2017.

**2 Commencement**

These regulations come into force on 2 October 2017.

**3 Principal regulations**

These regulations amend the Engine Fuel Specifications Regulations 2011 (the **principal regulations**).

**4 Regulation 5 amended (Interpretation)**

(1) In regulation 5(1), insert in their appropriate alphabetical order:

**DVPE** means dry vapour pressure equivalent

**fuel ethanol E85** means a blend of petrol and ethanol, containing not less than 70% ethanol by volume and not more than 85% ethanol by volume, intended for use in dedicated E85 spark-ignition internal combustion engines

**methanol** means methyl alcohol or the chemical component CH<sub>3</sub>OH, whether or not it contains additives, intended for blending with petrol for use as a fuel in spark-ignition internal combustion engines

**methyl tertiary butyl ether** means an organic compound with the chemical component  $(\text{CH}_3)_3\text{COCH}_3$  intended for blending with petrol for use as a fuel in spark-ignition internal combustion engines

**oxygenate** means an organic compound that contains oxygen (for example, an alcohol or an ether)

**total oxygen**, in relation to a fuel, means the sum (expressed as weight percentage oxygen in the fuel) of the oxygen contribution from all of the individual oxygenates that are blended in the fuel

- (2) In regulation 5(1), revoke the definitions of **other oxygenates** and **oxygenates**.

**5 Regulation 8 replaced (Ethanol component of petrol/ethanol blends sold by retail sale)**

Replace regulation 8 with:

**8 Requirements relating to petrol/ethanol blends sold by retail sale**

- (1) This regulation applies to petrol that is blended with ethanol.
- (2) The petrol must contain a corrosion inhibitor.
- (3) The ethanol component of the petrol—
  - (a) must be no greater than the maximum percentage by volume set out in Schedule 1; and
  - (b) must contain denaturant, which must be unleaded petrol with the following characteristics:
    - (i) end point as required by Schedule 1; and
    - (ii) sulphur as required by Schedule 1; and
    - (iii) appearance as required by Schedule 4; and
  - (c) must have properties that conform to the limits specified in Schedule 4 when tested by the methods specified in that schedule.

**8A Requirements relating to petrol/methanol blends sold by retail sale**

- (1) This regulation applies to petrol that is blended with methanol.
- (2) The petrol must contain a corrosion inhibitor and a co-solvent (such as ethanol).
- (3) The methanol component must be no greater than the maximum percentage by volume set out in Schedule 1.

**8B Requirements relating to fuel ethanol E85 sold by retail sale**

- (1) The petrol component of fuel ethanol E85 must conform to the limits in Schedule 1 when tested by the methods specified in that schedule.
- (2) Fuel ethanol E85 must have properties that conform to the limits specified in Schedule 1A when tested by the methods specified in that schedule.

**6 Regulation 13 amended (Requirements relating to petrol sold by non-retail sale)**

In regulation 13, replace “other oxygenates” with “total oxygen”.

**7 Regulation 14 replaced (Requirements relating to petrol/ethanol blends sold by non-retail sale)**

Replace regulation 14 with:

**14 Requirements relating to petrol/ethanol blends sold by non-retail sale**

- (1) Any blend of petrol and ethanol must contain a corrosion inhibitor.
- (2) The petrol component of any blend of petrol and ethanol must conform with the requirements in regulation 13.
- (3) The ethanol component of any blend of petrol and ethanol must—
  - (a) contain denaturant, which must be unleaded petrol with the following characteristics:
    - (i) end point as required by Schedule 1; and
    - (ii) sulphur as required by Schedule 1; and
    - (iii) appearance as required by Schedule 4; and
  - (b) have properties that conform to the limits specified in Schedule 4 when tested by the methods specified in that schedule.
- (4) Fuel ethanol E85 is not required to comply with subclause (2) or (3)(a)(iii) or (b).

**14A Requirements relating to petrol/methanol blends sold by non-retail sale**

- (1) The petrol component of any blend of petrol and methanol must conform with the requirements in regulation 13.
- (2) Any blend of petrol and methanol must contain a corrosion inhibitor and a co-solvent (such as ethanol).

**14B Requirements relating to fuel ethanol E85 sold by non-retail sale**

- (1) The petrol component of fuel ethanol E85 must have properties in respect of sulphur, lead, benzene, total aromatic compounds, total oxygen, olefins, manganese, and phosphorus that conform to the limits specified in Schedule 1 when tested by the methods specified in that schedule.
- (2) Fuel ethanol E85 must have properties that conform to the limits specified in Schedule 1A when tested by the methods specified in that schedule.

**8 Regulation 18 amended (Labelling requirements relating to retail containers and engine fuel pumps)**

- (1) After regulation 18(3), insert:

- (3A) If petrol contains methanol greater than 1% by volume, the seller of the petrol must ensure that the dispensing pump or container is clearly marked to display—
- (a) the maximum percentage by volume of methanol that the petrol contains (which must be no greater than the limit set out in Schedule 1); and
  - (b) the words “May not be suitable for all vehicles/engines. Check with the manufacturer before use.”
- (2) After regulation 18(4), insert:
- (4A) For a blend of diesel and biodiesel containing more than 5% by volume biodiesel, the seller of the blend must ensure that the dispensing pump or container is clearly marked to display—
- (a) the maximum percentage by volume of fatty acid methyl esters that the blend contains (which must be no greater than the limit set out in Schedule 2); and
  - (b) the words “May not be suitable for all vehicles/engines. Check with the manufacturer before use.”

**9 Regulation 19 amended (Calculating pool averages)**

Replace regulation 19(7) to (9) with:

- (7) In any period of 6 consecutive months, the sum of the monthly journal entries must not be a negative number.

**10 Regulation 21 amended (Accreditation)**

In regulation 21, replace “Ministry of Economic Development” with “Ministry of Business, Innovation, and Employment”.

**11 Schedule 1 replaced**

Replace Schedule 1 with the Schedules 1 and 1A set out in Schedule 1 of these regulations.

**12 Schedule 2 amended**

- (1) In the Schedule 2 heading, after “17(3)”, insert “, 18(4A)(a)”.
- (2) In Schedule 2, item relating to fatty acid methyl esters (% volume), replace “5 maximum” with “7 maximum”.
- (3) In Schedule 2, item relating to total contamination (mg/kg), replace “IP 440” with “ASTM D6217”.
- (4) In Schedule 2, footnote 7, replace “5%” with “7%”.
- (5) In Schedule 2, footnote 7, replace “852 kg/m<sup>3</sup>” with “854 kg/m<sup>3</sup>”.

**13 Schedule 3 replaced**

Replace Schedule 3 with the Schedule 3 set out in Schedule 2 of these regulations.

**14 Schedule 4 amended**

(1) In Schedule 4, item relating to methanol (% volume), replace “0.5 maximum” with “1.0 maximum”.

(2) In Schedule 4, replace the item relating to water (% volume) with:

Water (% mass)	1.26 maximum	ASTM E203 or EN 15489
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(3) In Schedule 4, replace the item relating to existent gum (solvent washed) (mg/100 ml) with:

Existent gum (solvent washed) (mg/100 ml)	5 maximum	ASTM D381
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(4) In Schedule 4, replace the item relating to inorganic chloride (mg/l) with:

Inorganic chloride (mg/l or mg/kg)	10 maximum (mg/l) or 12.6 maximum (mg/kg)	ASTM D7319 or ASTM D7328
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(5) In Schedule 4, replace the item relating to sulphur (mg/kg) with:

Sulphur (mg/kg)	Until close of 30 June 2018:	IP 497 or ASTM D5453
	30 maximum	
	From 1 July 2018:	
	10 maximum	

(6) In Schedule 4, footnote 15, replace “regulation 8(a)” with “regulation 8(3)(b)”.

(7) In Schedule 4, footnote 15, replace “regulation 14(2)(a)” with “regulation 14(3)(a)”.

**Schedule 1  
Schedule 1 replaced**

<b>Schedule 1 Requirements for petrol</b>		
		rr 7, 8, 8A(3), 8B(1), 13, 14, 14B(1), 18(3A), 19(1)
<b>Property</b>	<b>Limits</b>	<b>Test method</b>
Research octane number (RON)	Regular grade fuel: 91.0 minimum	ASTM D2699
	Premium grade fuel: 95.0 minimum	ASTM D2699
Motor octane number (MON)	Regular grade fuel: 81.0 minimum	ASTM D2700

**Engine Fuel Specifications Amendment Regulations**

2017/259

2017

Schedule 1

<b>Property</b>	<b>Limits</b>	<b>Test method</b>
	Premium grade fuel: 85.0 minimum	ASTM D2700
Colour	Not to be mistaken for water	Visual
Percentage volume evaporated at 70°C (E70)	22 minimum <sup>1</sup> 48 maximum <sup>2</sup>	ASTM D86
Percentage volume evaporated at 100°C (E100)	45 minimum 70 maximum	ASTM D86
Percentage volume evaporated at 150°C (E150)	75 minimum	ASTM D86
End point (°C)	210 maximum	ASTM D86
Residue (% volume)	2 maximum	ASTM D86
Flexible volatility index <sup>3</sup> [DVPE (kPa) + (0.7 × E70)]	115.0 maximum	ASTM D86 and ASTM D5191
Vapour Pressure <sup>4</sup> (DVPE) (kPa)	Maxima: Auckland and Northland: 65 kPa summer, 80 kPa autumn and spring, 90 kPa winter; rest of North Island: 70 kPa summer, 80 kPa autumn and spring, 90 kPa winter; South Island: 75 kPa summer, 85 kPa autumn and spring, 95 kPa winter Minimum: 45 kPa all year	ASTM D5191
Copper strip corrosion (3 hours at 50°C)	Class 1 maximum	ASTM D130
Sulphur (mg/kg)	Until close of 30 June 2018: 50 maximum From 1 July 2018: 10 maximum	IP 497 or ASTM D5453

<sup>1</sup> For regular and premium grade petrol in summer, a minimum E70 of 20% is permitted. Petrol that complies with the previous season's quality, and that is stored in a filling-station tank to which fewer than 3 deliveries of petrol have been made since 6 weeks before the beginning of the season, is regarded as complying with this specification for up to 6 weeks after the beginning of the season.

<sup>2</sup> For regular and premium grade petrol blended with more than 1% volume oxygenates, the E70 maximum is increased by 1% per 1% volume oxygenates in the blend.

<sup>3</sup> For regular and premium grade petrol blended with more than 1% volume oxygenates, the flexible volatility index maximum allowed is 115.0 summer; 120.0 autumn and spring; 130.0 winter. Petrol that complies with the previous season's quality, and that is stored in a filling-station tank to which fewer than 3 deliveries of petrol have been made since 6 weeks before the beginning of the season, is regarded as complying with this specification for up to 6 weeks after the beginning of the season.

<sup>4</sup> For regular and premium grade petrol blended with more than 1% oxygenates, the maximum vapour pressure allowed is Auckland and Northland: 72 kPa summer, 87 kPa autumn and spring, 97 kPa winter; rest of North Island: 77 kPa summer, 87 kPa autumn and spring, 97 kPa winter; South Island: 82 kPa summer, 92 kPa autumn and spring, 102 kPa winter. Petrol that complies with the previous season's quality, and that is stored in a filling-station tank to which fewer than 3 deliveries of petrol have been made since 6 weeks before the beginning of the season, is regarded as complying with this specification for up to 6 weeks after the beginning of the season.

**Engine Fuel Specifications Amendment Regulations**

Schedule 1

2017

2017/259

<b>Property</b>	<b>Limits</b>	<b>Test method</b>
Existent gum (solvent washed) (mg/100 ml)	5 maximum	ASTM D381
Oxidation stability induction period (minutes)	360 minimum	ASTM D525
Lead (mg/l)	5 maximum	IP 224 or ASTM D5059
Benzene (% volume)	1 maximum	ASTM D5580
Total aromatic compounds (including benzene) (% volume)	42 maximum pool average and 45 maximum cap	ASTM D5580
Ethanol (% volume) <sup>5</sup>	10 maximum	ASTM D4815
Olefins (% volume)	18 maximum	ASTM D1319 or ASTM D6839
Manganese (mg/l)	2.0 maximum	ASTM D3831 or BS EN 16136
Phosphorus (mg/l)	1.3 maximum	ASTM D3231
Total oxygen (% mass)	Petrol blended with not more than 5% volume ethanol: 2.7 maximum Petrol blended with more than 5% and not more than 10% volume ethanol: 3.7 maximum	ASTM D4815 ASTM D4815
Methyl tertiary butyl ether (% volume)	1 maximum	ASTM D4815
Methanol (% volume)	3 maximum	ASTM D4815

**Schedule 1A  
Requirements for fuel ethanol E85**

rr 8B(2), 14B(2)

<b>Property</b>	<b>Limits</b>	<b>Test method</b>
Acidity (as acetic acid CH <sub>3</sub> COOH) (% mass)	0.006 maximum	ASTM D1613
Copper strip corrosion (3 hours at 50°C)	Class 1 maximum	ASTM D130
Ethanol (% volume)	70.0 minimum 85.0 maximum	ASTM D5501
Existent gum (solvent washed) (mg/100ml)	5 maximum	ASTM D381
Inorganic chloride (mg/l or mg/kg)	10.0 maximum (mg/l) or 12.6 maximum (mg/kg)	ASTM D7319 or ASTM D7328
Methanol (% volume)	1.0 maximum	ASTM D5501
pHe	6.5 minimum 9.0 maximum	ASTM D6423

<sup>5</sup> Regulation 8(3)(c) provides that ethanol must comply with Schedule 4 (requirements for denatured ethanol for blending).



<b>Property</b>	<b>Limits</b>	<b>Test method</b>
Silver strip corrosion	Class 1 maximum	ASTM D130
Sulphur (mg/kg)	Until close of 30 June 2018: 30 maximum From 1 July 2018: 10 maximum	IP 497 or ASTM D5453
Vapour pressure (DVPE) (kPa)	38 minimum  Maxima: Auckland and Northland: 62 summer, 70 autumn and spring, 80 winter; rest of North Island: 68 summer, 75 autumn and spring, 80 winter; South Island: 70 summer, 80 autumn and spring, 85 winter	ASTM D5191
Water (% mass)	1.26 maximum	ASTM E203 or EN 15489

**Schedule 2  
Schedule 3 replaced**

r 13

**Schedule 3  
Requirements for biodiesel**

rr 10, 16, 17(2)

<b>Property</b>	<b>Limits</b>	<b>Test method</b>
Fatty acid methyl esters (% mass)	96.5 minimum	EN 14103
Density at 15°C (kg/m <sup>3</sup> )	860 minimum 900 maximum	ASTM D1298 or ASTM D4052
Viscosity at 40°C mm <sup>2</sup> per second	2.0 minimum 5.0 maximum <sup>6</sup>	ASTM D445
Flash point (°C)	100 minimum	ASTM D93
Sulphur (mg/kg)	10 maximum	IP 497 or ASTM D5453
Carbon residue (on 100% distillation residue) (% mass)	0.05 maximum	ASTM D4530
Cetane number	51 minimum <sup>7</sup>	ASTM D613 or ASTM D6890
Sulphated ash content (% mass)	0.020 maximum	ASTM D874
Water (mg/kg)	500 maximum	IP 438

<sup>6</sup> Regulations 10(a) and 17(2)(a) provide that, in the case of the biodiesel component of any blend of diesel and biodiesel, the maximum viscosity at 40°C is 6.0 mm<sup>2</sup> per second.

<sup>7</sup> Regulations 10(b) and 17(2)(b) provide that, in the case of the biodiesel component of any blend of diesel and biodiesel, the minimum cetane number is 47.

<b>Property</b>	<b>Limits</b>	<b>Test method</b>
Total contamination (mg/kg)	24 maximum	EN 12662
Copper strip corrosion (3 hours at 50°C)	Class 1 maximum	ASTM D130
Oxidation stability, 110°C (hours)	8.0 minimum <sup>8</sup>	EN 14112 or EN 15751
Acid value (mg KOH/g)	0.50 maximum	ASTM D664
Iodine value (g iodine/100 g)	140 maximum	EN 14111
Linolenic acid methyl ester (% mass)	12.0 maximum	EN 14103
Polyunsaturated ( $\geq 4$ double bonds) methyl esters (% mass)	1 maximum	EN 15779
Methanol (% mass)	0.20 maximum	EN 14110
Monoglycerides (% mass)	0.80 maximum	ASTM D6584
Diglycerides (% mass)	0.20 maximum	ASTM D6584
Triglycerides (% mass)	0.20 maximum	ASTM D6584
Free glycerol (% mass)	0.020 maximum	ASTM D6584
Total glycerol (% mass)	0.25 maximum	ASTM D6584
Group I metals (Na+K) (mg/kg)	5.0 maximum	EN 14538 or EN 14108 and EN 14109
Group II metals (Ca+Mg) (mg/kg)	5.0 maximum	EN 14538
Phosphorus (mg/kg)	4.0 maximum	EN 14107 and EN 16294

Michael Webster,  
Clerk of the Executive Council.

### Explanatory note

*This note is not part of the regulations, but is intended to indicate their general effect.*

These regulations, which come into force on 2 October 2017, amend the Engine Fuel Specifications Regulations 2011. The amendments—

- reduce the maximum allowable sulphur content in petrol from 50 parts per million to 10 parts per million. This change takes effect on 1 July 2018:
- introduce a total oxygen limit of—
  - 2.7% mass for petrol blended with not more than 5% volume ethanol:
  - 3.7% mass for petrol blended with more than 5%, but not more than 10%, volume ethanol:

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<sup>8</sup> Regulation 10(c) provides that, in the case of the biodiesel component of any blend of diesel and biodiesel sold by retail sale, the minimum oxidation stability is 10.0 hours.

- increase the limit for methanol in petrol from 1% to 3% volume:
- increase the limit for biodiesel in diesel from 5% to 7% volume:
- introduce requirements for petrol blended with more than 70%, but not more than 85%, ethanol (defined as fuel ethanol E85):
- make other minor changes to the regulations (such as prescribing additional test methods for certain fuel properties).

The regulations incorporate by reference various standards, procedures, and test methods. The incorporated material has no effect until it is made available for inspection at the head office of the Ministry of Business, Innovation, and Employment (*see* section 35(2) to (5) of the Energy (Fuels, Levies, and References) Act 1989).

### Regulatory impact statement

The Ministry of Business, Innovation, and Employment produced a regulatory impact statement in June 2016 to help inform the decisions taken by the Government relating to the contents of this instrument.

A copy of this regulatory impact statement can be found at—

- <http://www.mbie.govt.nz/info-services/sectors-industries/energy/liquid-fuel-market/documents-image-library/ris-updating-new-zealands-engine-fuel-specifications-6-dec-2016.pdf>
- <http://www.treasury.govt.nz/publications/informationreleases/ris>

Issued under the authority of the Legislation Act 2012.

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These regulations are administered by the Ministry of Business, Innovation, and Employment.