

# FS 2024 -1- Draft Determination Fuels Quality Standards

---



**UTILITY REGULATION AND COMPETITION OFFICE  
THE CAYMAN ISLANDS**

Publication Date: 30 July 2024  
Response Date: 14 August 2024

## Table of Contents

<b><u>A.</u></b>	<b><u>INTRODUCTION.....</u></b>	<b><u>3</u></b>
<b><u>B.</u></b>	<b><u>LEGAL FRAMEWORK.....</u></b>	<b><u>4</u></b>
<b><u>C.</u></b>	<b><u>FS 2023 – 1 – CONSULTATION.....</u></b>	<b><u>7</u></b>
<b><u>D.</u></b>	<b><u>COMMENTS RECEIVED AND OFFICE RESPONSES .....</u></b>	<b><u>8</u></b>
<b><u>E.</u></b>	<b><u>DETERMINATION (DRAFT).....</u></b>	<b><u>33</u></b>
<b><u>F.</u></b>	<b><u>APPENDIX.....</u></b>	<b><u>34</u></b>

---

## A. Introduction

1. The Utility Regulation and Competition Office ('OfReg', or the 'Office') is the independent multi-sector regulator, with responsibility for the key utilities providers in the Cayman Islands, including the fuel sector ('Fuel Sector'), in addition to the electricity, information and communications technology ('ICT'), water, and wastewater sectors.
2. Different decisions by the Office will affect persons and organisations throughout the islands in different ways. It is therefore important that the Office make regulatory decisions and propose new standards/regulations with the appropriate input from persons with sufficient interest, or who are likely to be affected by the outcome of such decisions. Consultations are an essential aspect of regulatory accountability and transparency. They provide a formal mechanism for these persons to express their views. The requirement for the Office to consult is mandated in its enabling legislation.
3. The Office through the Fuel Standards Committee (FSC) shall establish the standards for certain type of fuels to be imported, caused these standards to be published and to provide periodic reports to the Minister on its operation.
4. In order for the Office to carry out its duties effectively and efficiently regarding our regulatory remit, the Office sees it necessary to develop the Fuels Quality Standards for gasoline, ethanol blended gasoline, diesel, bio-diesel and propane.
5. On 1 November 2023, the Office invited the relevant fuel sector players to participate in the FS 2023 – 1 – Consultation Proposed Fuels Quality Standards. The Proposed Fuels Quality Standards were appended to the Consultation Document.
6. The consultation period closed for submissions on 30 November 2023.
7. At the close of the consultation period, Rubis Cayman Islands limited ('RCIL'), Sol Petroleum (Cayman) Ltd. ('Sol'), Foster Group, Refuel, and Home Gas Ltd provided comments on the Consultation. A representative of the Department of Vehicles and Equipment Services was invited but no responses were received.
8. In this document, the Office addresses the issues raised in FS 2023 – 1 – Consultation, and puts forward a revised Fuels Quality Standards, which is included in Appendix 1 of this draft Determination.

## B. Legal Framework

9. The Office according to its sectoral legislation, Dangerous Substance Act (2017 Revision) (DSA) under sections 9A through to 9D established a Fuel Standards Committee to carry out duties as prescribed under the Act.
10. Section 9A (1) There is established a Fuel Standards Committee to carry out the duties specified in this Law and the Committee shall consist of –
  - (a) the Chief Fuels Inspector who shall be chairperson;
  - (b) the Director of the Department of Environmental Health or his nominee;
  - (c) the Director of Environment or his nominee;
  - (d) the Director of the Water Authority or his nominee; and
  - (e) Repealed by section 8 of Law 52 of 2016.
  - (2) The Chief Executive Officer shall appoint an individual to be secretary to the Committee, after consulting the chairperson of the Committee; and the secretary shall take minutes of meetings, carry out such other duties and perform such other functions as are assigned by the chairperson.
  - (3) The Committee may appoint or empanel sub-committees, whether from among members of the Committee or from among persons outside of the Committee or both, to study and make recommendations to the Committee on any aspect of the regulation of fuel quality and related issues referred by the Committee.
  - (4) Members of a sub-committee who are not members of the Committee are required to have-
    - (a) relevant scientific or technical knowledge in the area of fuel quality standards; or
    - (b) qualifications in chemistry, biology or environmental studies, or both such knowledge and qualifications; and such members shall be paid allowances as the Board may determine.
  - (5) The payment of such allowances shall be paid out of the funds of the Office.
  - (6) The procedures of a sub-committee shall be determined by the chairperson of the Committee in accordance with this Law and regulations.
11. Section 9(B). The Committee shall carry out such duties as are specified in this Law and in regulations and such duties may include -
  - (a) establishing the standards of certain types of fuel to be imported, distributed and used in the Islands;
  - (b) publishing or causing to be published, in such medium as they determine, **such** standards and the testing methods to be used by importers and the Chief Fuels

- Inspector in the inspection of fuel in order to ensure compliance with the standards; and
- (c) providing quarterly, bi-annual, annual or such other periodic reports to the Minister on its operations.
12. Section 9(C). (1) The Committee shall meet at such times as may be necessary for the transaction of business and such meetings shall be held at such places and times and on such days as the Committee determines.
- (2) The chairperson of the Committee shall preside at meetings of the Committee.
- (3) The quorum of the Committee shall be three voting members of the Committee.
- (4) Subject to this Law, the Committee shall have power to regulate its own practice and procedure and shall take all actions and reach its decisions by a majority of votes and, in addition to an original vote, the chairperson shall have a casting vote in any case in which the voting is equal.
- (5) If a member of the Committee has any pecuniary or other interest in any matter to be dealt with by the Committee he shall disclose the fact to the Committee and shall not take part in any meeting at which the matter is considered or discussed.
- (6) A member who fails to comply with subsection (5) commits an offence and is liable -
- (a) on summary conviction to a fine of \$20,000 and to imprisonment for two years or to both; or
- (b) on conviction on indictment to a fine of \$50,000 and to imprisonment for five years or to both, unless he proves that he did not know that the matter in which he had an interest was the subject of consideration at that meeting.
- (7) A disclosure under subsection (5) shall be recorded in the minutes of the meeting of the Committee.
- (8) For the purposes of subsection (5), a member of the Committee shall be treated, as having a pecuniary interest in a matter if he is the director or employee or consultant of the importer who is the subject of the matter.
13. 9(D) (1) Where, after inspections are carried out in accordance with this Law, it is found by the Chief Fuels Inspector or by an inspector that an importer has been importing and distributing to operators fuel which does not accord with standards published under section 9B, the Chief Fuels Inspector shall require the importer to comply forthwith with any written direction not inconsistent with this Law which the Chief Fuels Inspector believes on reasonable grounds is necessary to ensure that the importation or distribution of such fuel is immediately discontinued.

(2) An importer who fails to comply with a direction under subsection (1) commits an offence and is liable to an administrative penalty; and the relevant import permit of such person may be suspended or revoked in accordance with the procedure set out in this Law.

(3) An importer who, more than once in any period of one year, imports and distributes fuel which is found by the Chief Fuels Inspector not to be in accordance with the standards set by the Fuel Committee commits an offence and is liable to an administrative penalty; and the relevant import permit of such person may be suspended, or cancelled in accordance with the procedure prescribed by this Law.

## C. FS 2023 – 1 – Consultation

14. In the closed **FS 2023 - 1 - Consultation**, the Office as mandated by the DSA enlisted the established FSC's subcommittee to study and make recommendations to FSC on any aspect of the fuel quality standards and the related issues referred to the FSC.
15. The proposed Fuels Quality Standards were appended to the consultation document for all the fuels under consideration. These included the various parameters, specifications and testing methods, which comprised the standard for each fuel.
16. The proposed standard also sought to address other related issues to aid with the regulation of the standard and the industry.
17. A closed consultation was done with the FSC's subcommittee where they were invited to study the proposed standards and make recommendations.
18. Fuels Specifications and Testing sub-committee respondents were:
  - Home Gas Ltd (HGL) – John Carallo, Will Day and Lynval Watkins
  - Rubis Cayman Islands Limited (RCIL) – Dustin Kersey
  - SOL – Myron Blair
  - Refuel – Dow Travers, James McGinn
  -
19. The respondent for the subcommittee member for Environmental and Socioeconomic impact was:  
Foster Group – John Michael Foster
20. In the consultation, the Office posed seven specific questions regarding the proposed Standards. The Office will now present the questions posed, the answers received and our comments on the respondents' submissions.

## D. Comments Received and Office Responses

21. The Office received five responses to **FS 2023 – 1 – Consultation**.

### Question 1:

22. Please review the Fuel Quality Standards thoroughly and provide any feedback, concerns, or questions you may have, as it relates to the various parameters, specifications and testing methods for each type and grade of fuel. Noting grades of gasoline are identified by the anti-knock index. Is your entity able to provide fuels which meet the specifications listed?

#### (1). Foster Group

Your choice of ASTM International is reasonable. 95 RON would satisfy most automotive engine requirements. See attached spec listing as an OEM required standard for Gasoline and Diesel. HD-5 propane fuel specification is widely used in the USA and is appropriate for our market in the Cayman Islands.

<b>OTTO</b>	Verdampfte Menge E70 / Evaporation E70	[% (V/V)]	>=20 / <=50
	ROZ (Basis ROZ 95)	[ - ]	>94
	Schwefelgehalt / Sulfur content	[ppm]	<50
	Mangengehalt / manganese content	[mg/l]	<=2
	Bleigehalt / Lead content	[mg/l]	<=2
	Sauerstoffgehalt / oxigene content	[%(m/m)]	<=10
	Ethanol	[%(V/V)]	<=25
	Methanol	[%(V/V)]	<=3
	Olefine / olefins	[%(V/V)]	<18
	Aromaten / aromates	[% (V/V)]	<35
	Dampfdruck (Sommer) / vapor pressure	[kPa]	>=45 / <=60



## Office Response

The Office notes comments.

### (2). SOL

We commend the Office of Regulation (OfReg) for their continued progress in adopting standards for consumers and providers of motor fuels in the Cayman Islands. We also commend the references and apparent willingness to benefit from regulations and standards from other jurisdictions. As an example, we note the reference to ASTM and to the Automotive Fuel Rating, both of which are broadly adopted in jurisdictions beyond their origin. This practice of applying standards such as these can allow the Cayman community to benefit from tried and tested standards.

To this end we are supporters of Caymanian product standards aligning with those of the likely jurisdictions of production or origin, where these standards will meet the needs of the Caymanian public. Where this is possible, the community may benefit from economies of scale because products used in larger jurisdictions are capable of being used in the Cayman Islands. Conversely, if standards are peculiar to the Cayman Islands, then there will be loss of economies of scale

We comment on the parameters, specifications and testing methods in response to your questions that follow. With reference to the grades of gasoline being identified by anti-knock index, this is not our interpretation. We do understand that gasolines identification will include the anti-knock index, but it is not limited to the same. We believe that other identifications and distinctions that are beneficial to the consumer should be permitted as well. As an example, it is proven and accepted that varied additive formulations have beneficial properties at any AKI level. As a result, there are jurisdictions which prescribe the lowest additive content allowed.

Implementation of parameters, specifications, standards, testing methods and any other requirements should commence no less than 120 days after establishment.

## Office Response

The Office supports the point of optimizing on the economies of scale by importing fuels from jurisdiction which already adopt known specifications and testing methods to establish quality at the point of production. Fuels at their origin of production are not additized and are not analyzed on the certificate of analysis (COA) because of vastness of types. Therefore, it would not be prudent to establish additives as a specification of these standards, but does not discourage their used.

### (3). RCIL

Rubis Cayman Islands Limited imports fuels that currently meet USA specifications. In general, why are EU standards being recommended when the vast majority of the ... imported products are coming from the USA? The products are being imported from the USA, the labs certifying the products are in the USA. It does not make sense to use EU standards. [See RCIL response document for additional information]

### Office Response

The Office notes RCIL concerns and now presents the table below comparing the proposed standards, RCIL proposed changes and the Office’s response to those changes with comments.

### Gasoline

No:	Fuel Quality Standard (FQS) Parameter & Testing Method	FQS Specification	RCIL Proposed Change	Office Response
1	Sulfur – ASTM D5453	91 RON grade: 150mg/Kg maximum	91 RON grade: 80ppm as the upper limit	Maximum 80 mg/kg (80ppm)
2	Distillation – ASTM D86	Final boiling point 210°C maximum	225°C Maximum as the US Spec	According to ASTM D86 the final boiling point temperature is less than or equal to 250°C and the COAs submitted to the Office the temperature for this parameter is typically above 210°C and less than 225°C.
3	Induction period – oxidation stability – ASTM D525	360 minutes minimum	US Spec 240 minutes	The induction period at 100°C is calculated by the formula detailed in ASTM D525. The COAs submitted to the Office indicate time which is greater than 240 minutes. Hence 240 minutes will be the minimum time.
4	Lead – ASTM D3237	5mg/L maximum	US spec 13mg/L	The standard states the concentration range of lead per US Gallon is 2.5mg/L - 25mg/L. The EU standard EN 228 states the max concentration of 5mg/L. Therefore, the specification

				will be change to the range as detailed in the standard.
5	Olefins – ASTM D1319	18% v/v maximum	Not measured in the US Spec	Not previously reported in the COAs submitted to the Office. However, according to the “signance of used” as stated in the standard, this test is important to determine the quality of motor fuels.
6	Aromatics – ASTM D1319	45% v/v maximum with 42% v/v maximum pool average across all grades	45% not very useful and the result can just be reported by the lab rather than having a maximum limit	The Office accepts that the lab must test this parameter and the results should be stated by the lab.
7	Motor Octane Number (MON) – ASTM D2700	91 RON Grade: 81.0 minimum; 95 RON grade: 85.0 minimum	AKI 87 – 82 min AKI 89 – 83 min AKI 93 – 87 min	AKI 87 – 82 MON min AKI 89 – 83 MON min AKI 91 – 86 MON min AKI 93 – 87 MON min
8	Research Octane Number (RON) – ASTM D2699	91 RON Grade: 91.0 minimum; 95 RON Grade: 95.0 minimum	AKI 87 – 92 min AKI 89 – 95 min AKI 93 – 97 min	AKI 87 – 92 RON min AKI 89 – 95 RON min AKI 91 – 95 RON min AKI 93 – 97 RON min
9	Standard Test Method for Vapour Pressure for Petroleum Products (Mini Method & Reid Method) – ASTM D5191 & D323	Not quoted	RVP is missing and 10psi maximum should be used	COAs submitted to the Office report vapour pressure. ASTM D323 stipulates a pressure range of 5 – 15psi. D5101 requires a final calculation to determine final vapour pressure. Therefore the Office specification for this parameter is 5psi minimum and 10psi maximum

10	Standard Specification for Automotive Spark-Ignition Engine Fuel – ASTM D4814	Not quoted	Driveability index missing and 591°C maximum	The Office notes that the specification was missing and accepts the rationale of the importance to driveability as a specification. Therefore, with a maximum vapour pressure of 10psi the corresponding driveability index is 591°C maximum.
11	ASTM Density @ 15°C	Not quoted	ASTM Density is missing and should be 720 to 780 kg/m <sup>3</sup>	The specification is missing and ASTM D4052 is added as the testing method with a specification's range of 710 – 780 kg/m <sup>3</sup> .
12	Standard Test Method for Manganese in Gasoline by Atomic Absorption Spectroscopy – ASTM D3831	Not quoted	ASTM D3831 MMT content is missing	This standard determines the total manganese content, present as methylcyclopentadienyl manganese tricarbonyl (MMT) in gasoline with the concentration range from 0.25mg/L to 40mg/L of manganese MMT. It can boost the octane level in gasoline but there are concerns with air pollutions. The COA's submitted suggested that the 0mg/L is maximum and this is accepted.

Diesel

No:	Fuel Quality Standard (FQS) Parameter & Testing Method	FQS - Specification	RCIL Proposed Change	Office Response
1	Standard Test Method for Calculated Cetane Index of Distillate Fuels – ASTM D 976	Cetane index 46 min	46 is too high, US Spec of 49 should be used which is also in line with CUC spec	CUC’s specification reports 40 as the minimum value with no maximum value specified. CUC uses ASTM D4737 as their testing method. ASTM D976 is recognized by the US EPA department as an alternate method for diesel fuel containing less than 500ppm of sulfur. A review of the COAs submitted indicate minimum value of 45, as such, the Office retains the value of 46.
2	Standard Test Method for Cetane Number of Diesel Fuel Oil – ASTM D613	Cetane number 46 minimum	46 is too high, US Spec of 45 should be used	A review of the ASTM D613 standard 46 is within the lower range, as such, the cetane number of 46 is retained.
3	Standard Test Method for Determination of Carbon Residue (Micro Method) – ASTM D4530	0.2% m/m maximum	0.2% max is too high, 0.1% max should be used	0.1% m/m is accepted and in alignment with D4530 testing method which is applicable for diesel.

4	Standard Test Method for Density, Relative Density, or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer method	820 – 850 kg/m <sup>3</sup>	820 – 850Kg/m <sup>3</sup> is too low, US spec of 820 – 876kg/m <sup>3</sup> should be used	820 – 876kg/m <sup>3</sup> specification is usually for #1 diesel which is for colder climates and cannot be accepted for our environment.
5	Standard Test Method for Distillation of Petroleum Products and Liquids Fuels at Amospheric Pressure – ASTM D86	T-95 360°C maximum	Should be removed as it is in the EU spec only (T95 limit does not exist in the US spec), T90 could be used with a spec of	T90 with a temperature 282 - 360°C is accepted.
6	Standard Test Methods for Flash Point by Pensky – Martens Closed Cup Tester – ASTM D93	61.5°C minimum	61.5°C is too high, 55°C should be used for road retail, 60°C should be used for marine applications and in line with CUC spec	52°C is typically the minimum flash point for #2 diesel. CUC fuel quality specification specifies 60°C as their flash point. 61.5°C will be considered as the maximum and not the minimum.
7	Standard Test Method for Determination of Total Sulfur in Light Hydrocarbons, Spark Ignition Enginer Fuel, Diesel Engine Fuel, and Engine Oil by Ultravoilet Fluorescence – ASTM D5453	10mg/kg maximum	10mg/kg max is 10ppm max and is too low, US spec of 15ppm should be used	Majority of diesel imported into the islands are sourced from the USA and their maximum specification for sulfur is 15mg/kg. The Office accepts this specification

8	Standard Test Method for Oxidation Stability of Distillate Fuel Oil (Accelerated Method) – ASTM D2274	2.5mg/100ml maximum	This EU spec is unnecessary, not measured in the US Spec	This test method provides a basis for the estimation of oxidation stability and this parameter becomes more relevant with biodiesel. Given that the Office as part of its NEP mandate is to facilitate alternate fuels. The Office sees this parameter as necessary.
9	Determination of aromatic hydrocarbon types in middle distillates - High performance liquid chromatography method with refractive index detection – IP 391	11% m/m maximum	Useless and should be removed	The equivalent ASTM standard is D6591. It is a test method to determine mon-aromatic, di-aromatic and poly-aromatic hydrocarbon contents in diesel fuels. The aromatic hydrocarbon content of motor fuel is a factor that can affect exhaust emission and fuel combustion characteristics. As such, IP 391 will be replaced by ASTM D6591.
10	Standard Test Method for Determining Filter Blocking Tendency – ASTM D2068	2.0 maximum	Not required by CUC who is the majority fuel user in Cayman, never heard this one, not sure what it is.....	This test method determines the fuel's ability to clog filters. It is more important for biodiesel and biodiesel blends. This item will be remove from the diesel standard and place into the biodiesel standard.

11	Liquid petroleum products - Determination of fatty acid methyl ester (FAME) content in middle distillates - Infrared spectrometry method – EN 14078	5.0% v/v maximum	5% max is too low, 7% should be used	This test method is the determination of Fatty Acid Methyl Ester (FAME) content in diesel. The Office accepts 7% v/v maximum. The testing method will be changed to ASTM D7371.
----	---	------------------	--------------------------------------	---



Ethanol

No:	Fuel Quality Standard (FQS) Parameter & Testing Method	FQS Specification	RCIL Proposed Change	Office Response
1	Standard Test Method for Acidity in Ethanol and Ethanol Blends by Titration – ASTM D7795	0.006% m/m maximum	0.006% m/m max is too low, 0.007% m/m max should be used	The acceptable levels of acidity in ethanol or ethanol blends is less than 200mg/kg (ppm) according to D7795. Therefore, the specification is changed to 200mg/kg as the maximum.
2	Standard Test Method for Determination of Ethanol Content of Denatured Fuel Ethanol by Gas Chromatography – ASTM D5501-09	95.6% v/v minimum	95.6% is too high, 93% should be used	According to the standard, the ethanol (purity) is 93 – 97 mass %. Therefore, the minimum mass % will be changed to 93.
3	Standard Test Method for Determination of Total Sulfur in Light Hydrocarbons, Spark Ignition Engine Fuel, Diesel Engine Fuel, and Engine Oil by Ultraviolet Fluorescence – ASTM D5453	10mg/kg maximum	10mg/kg max is 10ppm max and is too low, US spec of 30ppm should be used	The testing method EN 15486: Ethanol as a blending component for petrol – Determination of Sulfur content - Ultraviolet fluorescence method for the determination of the sulfur content of ethanol. The Office suggest 5mg/kg to 20 mg/kg as it aligns with the D5453 standard.

#### (4) Refuel

Our Gasoline and ULSD comply with ASTM D4814 and D975 respectively as well as all US Federal and local State regulations at the point of sale. We are confident in the quality. We have no issue with meeting these standards, but we do have several serious reservations around who bares the cost of these testing requirements when Refuel will soon be making 70+ shipments a month. It is our vision and intention to make emission reducing fuels commonplace in Cayman, while lowering the price to the consumer, for the benefit of Caymanians and consistent with the Cayman Island's Government's ESG policies. Given there is no statistically significant quality issue reported at Refuel, costly regulation of a currently non-existent problem would be by definition disproportionate. A testing system that is fair and proportionate on a unit by unit basis that also does not discriminate against renewable products must be established, and we support any action that does not increase our costs more than the competition on a unit by unit basis. Refuel would support exploring splitting the costs proportionally with other importers for OfReg to build an ASTM testing facility in Cayman as there are several issues with establishing a standard, and having no way in Cayman without said facility to test that standard, which we will address below and in later answers. Before that though, there is another overarching issue that needs to be addressed. If OfReg's intent is to increase competition, drive down fuel costs and encourage adoption of renewables they should be following what is witnessed in the EPA's substantially similar definitions referenced in Section 8 of the paper, and the Automotive Fuel Rating's definitions referenced in the definitions sections, and ASTM D4814 criteria referenced in Section 6 , or even the Dangerous Substance Law Fuel definitions, all of which do not differentiate Gasoline from Gasoline with less than 10% ethanol. Yet the office seems to be creating a two tiered system in this paper with the creation of a category called "Gasoline-Oxygenate Blend" which leads to some contradictions. Gasoline with less than 10% Ethanol, is Gasoline, and follows the same ASTM standard, it is not a separate product. The department should not be differentiating and increasing barriers to substitution amongst "substantially similar" substitutable gasoline products, the product meets ASTM D4814 and is substitutable or it doesn't, and any additive packages, detergents, octane boosters, oxygenates or otherwise used within the scope of ASTM D4814 are the prerogative of the company. The action of mandated differentiation is to the detriment of competition, the consumer, and with regard to E10 and Gasoline, renewable adoption.

Note, Section 10(1)&(2) mentions a mandated height, but due to varying tank shapes and sizes this would result in drastically different volumes as a percent of total across tanks.

### Office Response

The Office notes Refuel's comments. The Office would like to clarify that it currently has capability to conduct sampling and testing, which will form part of the verification of quality on island. However, it is the importer's responsibility to sample and test all imported fuels to certify quality using these standards as the reference. The Office also notes Refuel's concerns regarding the identification of Gasoline vs. Gasoline Oxygenate Blends. The Office believes that whilst the products may be substitutable for gasoline blends up to 10% of ethanol. Blends where the ethanol percentage are greater than 10.5%, the appropriate "E" designation is assigned as defined by the US Environmental Protection Agency (EPA). The Office notes from the ASTM D4814 that the concentrations and types of oxygenates are not specifically limited in this specification.

### (5) HGL

As a seasoned professional in the propane industry, I am writing to strongly recommend the adoption of the United States "Consumer Grade" HD-5 propane fuel specification as the standard for all propane suppliers in Cayman Islands. The HD-5 standard, established by the American Society for Testing and Materials (ASTM D1835-22), is a critical benchmark ensuring the quality and safety of propane fuel for various applications. It also stipulates stringent limits on other hydrocarbons, contributing to an environmentally friendly, reliable, and safe propane supply. Given the Cayman Islands Propane Industry and appliance retailers source their fuel and equipment from the United States, adopting HD-5 as the only standard for all suppliers and equipment will ensure uniform quality and compatibility with most of the equipment and appliances sold in the Cayman Islands. The HD-5 propane specification is the standard used by North American Manufacturers for the vast majority of propane appliances and equipment. Other blends of propane can cause issues with appliances and especially Autogas like cars and forklift engines. Those engines will not properly combust the propylene mixture causing engine issues. These other grades of propane are primarily used in Industrial applications and the production of plastics. We strongly encourage the government to consider and implement only the HD-5 propane specification as the baseline requirement for all propane suppliers in Cayman Islands. This step will not only ensure uniform quality but also enhance safety, reliability, and environmental responsibility within the propane industry.

### Office Response

The Office accepts the recommendation of adopting the ASTM D1835-22 "Standard Specification for Liquefied Petroleum (LP) gases".

**Question 2:**

23. Does your entity believe that it can provide certified laboratory reports indicating test parameters and results for each batch of fuel imported as set out in the Standards to establish the fuel quality?

**(1) Foster Group**

Nothing to add.

**Office Response**

The Office notes Foster's Group had "nothing to add" in response to this question.

**(2) SOL**

The test results we obtain today are available commercially from the labs. The more specific and uncommon the tests, the higher the cost. It is preferred to require the test most common to the larger jurisdictions. The cost of the future required testing will have to be recovered.

**Office Response**

The Office notes Sol's comments.

**(3) RCIL**

Rubis was unable to verify with the approved USA based labs that they could guarantee their ability to perform testing that would meet EU standards.

**Office Response**

The Office notes RCIL comments.

**(4) Refuel**

Firstly, It is critically important to this question to define Batch which is not defined or mentioned once in the paper outside of this question. We cannot answer with precision without knowing that because products are co-mingled and blended downstream of certification points.

Secondly, We are not Chevron, or Exxon, or Shell or any other of multi-billion dollar international or regional supplier. Much like how the Office is suggesting in Section 9(1) product information documentation in Cayman should be supplied at time of sale, the Certificates of Analysis and documentation we receive from our supplier's terminals in the US must accordingly comply with their local US regulations. We cannot change the US regulations. We have provided OfReg some examples of the type of Blendgrade COAs we can consistently provide, but we cannot provide anything further, depending on the batch definition without excessive costs. If the FSC or OfReg creates regulations that are incongruent with the US regulations at the time of sale above, in a manner that makes the COAs we provide incompatible with Cayman regulations, then we will be unable to comply and you will force us out of business and

create a regulated monopoly/duopoly in Cayman. We are happy to work with the Office on any reporting solution that only increases our unit costs by the same amount as the competition. Clearly we cannot support any reporting burden that hurts our competitive advantage or our ability to operate or consumer surplus. Moreover not having a testing facility in Cayman and enforcing us to stick to the COAs of particular brands in the US will hurt our buyer power, create switching costs, and market inefficiencies through foreclosure on product. Michael Porter, the founding father of competitive strategy's view on this topic is quite clear "The effect of many new product quality and environmental regulations, though they surely achieve some desirable social objectives, is to raise capital requirements, elevate economies of scale through the imposition of research and testing requirements and otherwise worsen the position of smaller firms in an industry and raise barriers facing new firms" You have the potential here, to dangerously raise the cost of testing requirements, "worsen the position of small firms[Refuel]" and devastate competition, dramatically raising consumer costs. You must create a testing system that is fair and proportionate on a unit by unit basis that does not discriminate against renewable products. (Note, we do not believe ASTM D1319 can be carried out. It is our understanding the sole source of dye used in the test became unavailable in 2018, and some of the tests measured through ASTM D4815 would be redundant in situations where oxygen below a threshold is detected.)

#### Office Response

A 'batch of fuel' refers to fuel originating from the same onshore tank or vessel compartment where the fuel was acquired and at the point in time when a sample was taking for testing and analysis. This fuel will be a homogenous product.

OfReg has sampling and testing capability, however, this will only be for quality assurance that is to verify the quality of the fuel rather than to certify that the fuel imported has met the specifications of these standards.

#### (5) HGL

When propane is purchased from a supplier in the United States we receive a Certificate of Analysis from an independent laboratory on the propane being supplied. Our supplier is contracted to only supply HD-5 propane which is delivered by ship from the United States Gulf Coast. I have attached our most recent Certificate of Analysis from November 13, 2023. We supply these reports with every propane tanker delivery.

#### Office Response

The Office notes HGL comments.

**Question 3:**

24. Is the AKI reproducibility limits and process for dispute resolution acceptable for the Standards?

(1) Foster Group

Yes, reasonable.

Office Response

The Office notes that Foster's Group comments.

(2) SOL

The dispute resolution is acceptable and should be applicable to the AKI. The AKI should also adhere to the same process and should not be an exception.

Office Response

The Office notes Sol's comments.

(3) RCIL

AKI does not have reproducibility limits. AKI is a result of a simple averaging calculation of RON and MON. The results of RON and MON testing have reproducibility limits. According to ASTM D2700 the reproducibility limit for MON is 0.9 (considering MON being between 80.0 and 90.0) According to ASTM D2699 the reproducibility limit for RON is 0.7 (considering RON being between 90.0 and 100.0) The dispute resolution process is outlined as using ASTM D3244. 4.3 Application of this practice requires the Acceptance Limit (AL) be determined prior to actual commencement of testing. Rubis asks how will the AL be established and who will be involved in agreeing to them.

Office Response

The Office agrees AKI does not have reproducibility limits and as such the word "reproducibility limit" deleted. ASTM D4814 Section 7.1 and 7.1.12 details the test methods to determine AKI. ASTM D3244 4.3 states "application of this practice requires the acceptance limit (AL) be determined prior to actual commencement of testing. Therefore, the degree of criticality of the specification, as determined by the Probability of Acceptance (P value) that is required to calculate the AL, shall have been mutually agreed upon between both parties prior to execution of actual product testing. As such, the operator, the supplier in this case, and the office, the receiver in this case, will mutually agreed on the the AL as detailed in the practice.

(4) Refuel

We are not certain how this functions in practice, with no ASTM facility or capability of testing AKI in Cayman. Is one to be prevented from turning over product while we wait for samples to be sent to the States for testing? This will greatly increase our working capital requirements and costs.

Office Response

The Office has some means of sampling and testing fuels with the equipment it acquires, but by no means the Office is a certified lab. The Office can after testing with its equipment can recommend if further testing is required or any other appropriate action as detailed in section 8.

(5) HGL

We agree with the AKI reproducibility limits as the Standard per my previous answers of utilizing the North American standards since that is our supply chain and they have the highest propane standards in the World.

Office Response

No further comments

**Question 4:**

25. What are your overall views on the condemnation and requalification of fuel? Are the processes and the responsibilities of the operators of retail, terminal or bulk plant facilities clear when a “stop-sale order” is issued? Do you think two attempts are adequate for requalifying the rejected fuel before disposal?

**(1) Foster Group**

Yes, reasonable. Yes, two attempts are adequate for requalifying the rejected fuel before disposal.

**Office Response**

The Office notes agreement.

**(2) SOL**

A “Stop Sale order” as it is worded in the document for Bulk fuel terminals creates challenges that can be difficult to resolve swiftly. Sol believes there should be facilitation for Bulk fuel terminals to respond. Sol believes there should be an agreed waiver process in the case that the product does not meet the standard and a variation does not make the product unfit as there are other conditions that deem it to be continued to be used.

For the Diesel – The ULSD spec, the standard for the Diesel should be the CUC Power company (the largest consumer) spec, as the equipment requirements would need to be met. Differing specifications will require distinct infrastructure, the cost of which will have to be passed on to consumers other than CUC. We agree that there should be coordination but to allow for differentiation of products, and to satisfy the Branding standard of the retail fuel brand.

**Office Response**

A review of the COAs for ULSD previously submitted indicates that there are no major deviations from the proposed standards.

**(3) RCIL**

Two attempts are not always sufficient and this should be assessed on a case by case basis. Specifically, the total affected volume of product is a factor that should be considered.

For a retail site with a tank capacity of 10,000 IG, two attempts may be sufficient and if disposal is required then ISO tanks and fuel trailers can support this operation. For a bulk terminal where a tank may contain 35,000 IG to over 1,000,000 IG, may be affected, multiple blending operations may be required supported by tanker deliveries. When dealing with a volume of this magnitude, as long as improvement is being made then more than two attempts may be reasonable. This is where the case by case



judgement based on lab results showing improvements would be beneficial. Finally, only the sea berth owner on Grand Cayman has the ability to move product from shore to a vessel. This is not a feature made available to all users of the berth and therefore the available operations for disposal and re-export will affect the actions available to reach resolution.

#### Office Response

The standards suggest that the operator in section 8(4 & 5) provides a detail process/method and expected results for consideration which will be reviewed and ultimately approval. When different processes/methods are being considered for requalification, the two attempts must be used and considered in any plans being proposed for approval.

#### (4) Refuel

Again we are not certain how this functions in practice, with no ASTM facility or capability of testing AKI in Cayman.

#### Office Response

The standards referenced ASTM D3244 as the means for determining the acceptable limits which is the process for the Operator and the Office to resolve any dispute if any parameter is “off spec”.

#### (5) HGL

The question of the deterioration of fuel does not actually apply to propane. Propane's resistance to deterioration is primarily attributed to its chemical properties and storage conditions. Propane is a hydrocarbon gas composed of carbon and hydrogen atoms, and its molecular structure lacks vulnerable bonds that are susceptible to oxidation or chemical breakdown over time. Unlike liquid fuels such as gasoline or diesel, which can degrade through exposure to air, moisture, and contaminants, propane remains inert and does not undergo significant reactions under normal storage conditions. Additionally, propane is typically stored in sealed and pressurized containers, preventing the ingress of air and moisture, further preserving its stability. These inherent chemical characteristics and storage conditions contribute to propane's exceptional shelf life and resistance to degradation compared to other fuels.

#### Office Response

No further comments

**Question 5:**

26. What are the suggested colours to identify the different fuels and grades for gasolines, diesel, biodiesel and ethanol blended gasolines at filling points on tanks, fill nozzle boots and labels on dispenser?

(1) Foster Group

I see there are no universal standards for the color of nozzle boot covers. However, in my experience the following colors make sense to me. Gasoline Regular unleaded should be **Green** with other colors allowed for the various grades. **Black** and **Yellow** should be reserved for Diesel fuels. More importantly is that the pump is clearly labelled with words and the grade and fuel rating are displayed on the nozzle or dispenser.

Office Response

The Office notes Foster's Group comments.

(2) SOL

We agree that there should be coordination but to allow for the differentiation of products, and to satisfy the Branding standard of the retail fuel brand. The coordination must exist in the service station for fill points to be coordinated with Bulk Terminal product colours for Terminal and Trucks. This is to avoid product mix when dropping fuel at retail stations. Nozzle colours are branding related. Sol wishes to maintain the below product colours at the Esso Retail Service station as per contractual obligations to the Exxon Mobil Brand Standards. The existing colour scheme has been in place for a very long time, changing the colours increases the chances of crossover contamination.

**Product Colors at  
Esso Service  
Stations**

<b>Product</b>	<b>Nozzle</b>	<b>Station Tank</b>	<b>Terminal / Truck</b>
Diesel	Yellow	Green	Green
EN5000	Blue	Red	Red
EN8000	Green	Blue	Blue

Office Response

The Office does not support two different colours to identify the same product. The same colours at the nozzle must be the same colours for the tanks and trucks.

(3) RCIL

Fuel	Grade	Colour
Gasoline	Regular Unleaded (alone), Midgrade, Plus	Green
	Premium, Supreme, High Test	Silver
E10	Regular Unleaded (alone) Midgrade, Plus	
Diesel	Diesel, Premium Diesel	Black
Biodiesel		

Office Response

The Office notes RCIL’s branding colours.

(4) Refuel

Refuel’s product branding has gone to great lengths to be clear, informative and colour coded. Gasoline labelling is BLUE, from the dispenser, to the grade selection button to the colour of the nozzle. “Gasoline” is labeled no fewer that 4 times per grade, and the button that has to be physically pressed to select the grade that clearly states, “Gasoline”, the grade “87”, “90” or “93”, and the octane measurement method. In addition, maximum Ethanol content is listed twice per grade. Diesel labelling is GREEN, again from the dispenser to the product selection button to the colour of the nozzle. Diesel is mentioned no fewer than 4 times, and again the button that has to be physically pressed to select the product clearly states “Diesel”. In addition, for Diesel, there is a large permanent tag attached to the hose that states “DIESEL”. E85, once approved, will be similarly labeled and branded in YELLOW.

As a result less than one half of one percent, <0.005%, of our customers fuel up incorrectly with the majority of issues actually occurring at the Full Service locations where there are verbal miscommunications not as a result of the labelling. We do not believe we should be spending any meaningful cost on this matter outside of physical barriers(nozzle sizing) as the issue is in over 99.995% of cases already resolved and we don’t believe any further labeling will meaningfully improve the situation.

Regardless, In 2019 OfReg created a discussion paper that recommended nozzle colours for Gasoline to be Blue and ULSD to be Black and stated that the Office would “not extend upstream to bulk fuel terminals or tank fill points” and that there would be “lesser focus on differentiation between grades of the same product”. We supported those recommendations and hope that they are not being reversed. We do not believe any changes need to be made but agree that the color scheme should certainly not extend any further than the nozzle boot colour for the same reason that your Office stated in that paper to “ensure the (regulatory) cost associated ...does not significantly impact them [consumer]” and because this is not a statistically significant issue.

Our entire branding and labeling is based around a colour coded scheme. From the website, to the dispensers, to the road signage labelling, to the nozzle colours, Gasoline is BLUE, and Diesel is GREEN and E85, once approved, will be YELLOW. Our first choice if there were to be an imposed standard for nozzle colors would therefore be to keep Gasoline as Blue and Diesel as Green and E85 as Yellow). However, the proposed nozzle colours of Gasoline being Blue, and Diesel being Black could be implemented with little difficulty if there is to be an imposed standard and we would support those colours for the colour coding of nozzles. We elaborate on our suggestions in the table below. BUT, due to the extent of our existing colour coding, other combinations could be disastrous for our brand, incredibly costly, damaging, and require untenable rebranding efforts. Even worse as mentioned below would be grade colour differentiation.

Fuel	Grade	Nozzle Colour	Reasoning
Gasoline/ E10	Regular	Blue (or any fourth colour, not Green or Yellow)	It is physically impossible with current equipment, and economically unviable for us to differentiate our grades by colour at the pump. Our Dispensers are 3+1 and 3+1+1. 3 Grades come from one hose and nozzle, differentiating would require a complete overhaul of dispensing equipment and result in the end of mid-grade which could no longer be blended locally.
Mid Premium E10	Regular	Same as Above, Blue	The department should not be differentiating and increasing barriers to substitution amongst substitutable gasoline products, this action is to the detriment of the consumer and competition, and with regard to E10 and Gasoline also the detriment of renewable adoption.
Mid Premium			



Diesel/B5	ULSD	Green,(or any fourth colour not Blue or Yellow)	B5 ULSD is ASTM grade fungible with ULSD and would not be differentiated from ULSD.
E85	E85	Yellow, Red (or any fourth colour not Blue or Green)	E85 should not be treated as other ethanol blended gasolines as it is not substitutable and carries a different ASTM standard. It requires clear and differentiated branding.

#### Office Response

The Office notes Refuel’s branding colours at the nozzle but also emphasis the colour coding of the fill points on the tanks to avoid comingling of products when offloading into the storage tanks.

#### (5) HGL

We strongly agree with the standardization of colours in the fuel industry for pipework and hoses based on ASME 13.1-2023. For propane vapour we would identify with yellow striping, rings, or pipework and propane liquid with brown rings or striping.

#### Office Response

No further comments

**Question 6:**

27. Do you agree to the labelling of dispensers to indicate type of product, grade of product and applicable automotive fuel rating?

(1) Foster Group

Yes.

**Office Response**

The Office notes Foster's Group agreement on labeling of dispensers.

(2) SOL

Sol does not take issue with labeling requirements, but labels should adhere to the Esso Brand standards. Implementation of labeling requirements should commence no less than 120 days after established.

**Office Response**

The Office wishes to standardize for public identification the type of product, by grade of product and AKI number for all retail outlets. Consideration will be given to 120 days for the standardization to be completed. The Office respects the importance of branding and has no desire to tamper with it. However, it is our opinion that the products identification information be incorporated into the branding elements so that customers can readily identify and select the fuel and grade they desired.

(3) RCIL

No.

What is the problem that is being resolved by declaring a lead substitute or predominate oxygenate on a dispenser? Rubis has never had a customer or end user inquire about these characteristics. The proposed standard states that the grade of the product is the Anti-Knock Index (AKI). It is not clear to Rubis what other applicable "automotive fuel rating" would be required and for what purpose?

**Office Response**

Section 9(2) indicates the required data for the dispenser labelling. Oxygenate is not required label for a dispenser.

(4) Refuel

The automotive fuel rating does not differentiate gasolines below 10% ethanol but section 9 does in great detail notably in 9(5)(d). As mentioned in Q1, we support a competitive industry and encourage renewable adoption, and so we do not believe this level of differentiation should be mandated.

**Office Response**

The Office notes Refuel's concerns regarding the identification of Gasoline vs. Gasoline Oxygenate Blends; as such, the wording of section 9(5)(d) was changed.

**(5) HGL**

It is imperative to have all fuel dispensers properly labelled not only for the consumers; but is a necessary safety measure for Emergency Services responding to any issues.

**Office Response**

No further comments

**Question 7:**

28. Do you agree to the proposed requirements regarding invoices as detailed in the Standards?

**(1) Foster Group**

Yes, reasonable

**Office Response**

The Office notes Foster's Group agreement on requirement for invoices.

**(2) SOL**

Sol does not take issue with the proposed requirements.

**Office Response**

The Office notes SOL's response.

**(3) RCIL**

No.

What is the problem that is being resolved by declaring a predominate oxygenate on an invoice? Rubis has never had a customer or end user inquire about these characteristics.

**Office Response**

Section 9 (1) indicates that the oxygenate type and content are indicated where applicable.

**(4) Refuel**

While not currently applicable to our model, our comments on substitutability would also apply here.



Office Response

The Office notes Refuel's comments.

(5) HGL

We agree with implementing minimum requirements for the billing of fuel and a delivery invoice created during each sale of propane fuel. The listed requirements are not totally applicable to propane, but at a minimum it should have customer details, date of the sale, quantity, propane product, unit price, and total price on each invoice. We truly appreciate defining a document storage period of one year. We currently maintain paper copies for 7 years which is onerous, we also retain digital copies of all tickets indefinitely.

Office Response

The Office accepts HGL comments.



## E. Determinations (Draft)

29. The Office took into consideration all the responses from the FSC subcommittee members and made modifications to the standards to ensure alignment with the existing certificate of analysis (COA) and the various ASTM standards. These proposed changes are highlighted in red in the revised standard in appendix 1 of this draft determination.
30. Consideration was also given to the fact that the fuels imported are from the USA refineries and/or terminals and are usually accompanied by COA prepared by certified labs certifying the fuels to the US specifications. Therefore, all references to European specifications were removed.
31. It was suggested that the industry be given 120 days to implement the standard after publication. The Office believes this time is too long period, as such, 30 days after publication the standards will be enforced.
32. In section 7, the Office has removed any reference to reproducibility limits as it relates to AKI. The Office has clarified the condition on which the Chief Fuels Inspector may take enforcement action, which is, utilization of the ASTM D3244 standard as the methodology to determine acceptable limits for various specifications being tested.
33. Generally, the responses concerning the two attempts to requalify or recertify the fuels before disposal or alternative used were not supported, but no alternative number of attempts was proposed. It is the view of the dissenting respondents that a case-by-case approach is more applicable. The Office disagrees and maintains the number of attempts is two. The words “downgraded to a lower grade” is added to clarify that this an option that the Office considers once the Operator engage the Chief Fuels Inspector in a consultation process.
34. The Office understands that the importance of branding colours to a retail network, as such, each retail outlet will be allowed to maintain their branding colours at their dispensers. To ensure consistency and to avoid confusion the same colour for the nozzle boot to identify the product type; the same colours must be used to identify the filling points for the tanks. It is also the office’s determination that all dispensers must be labelled as outlined in Rule 9(2) and 9(5a,b&c).



## **F. Appendix**

### 35. Fuel Quality Standards 2023 Revised



**DANGEROUS SUBSTANCES ACT (2017 REVISION)**  
**FUEL QUALITY STANDARDS 20XX**

**Publication Date: [30] 08] 2024**

FUEL QUALITY STANDARDS 20XX

**ARRANGEMENT OF STANDARDS**

1. Citation
2. Commencement
3. Definitions
4. Application
5. Exempted Fuels
6. Standards and Specifications for Fuels
7. Re-reproducibility Limits
8. Condemnation and Requalification of Fuel
9. Classification and Labelling for Sale
10. Retail Storage Tanks and Dispenser Filters
11. Product Registration
12. General Matters Connected to Standards
13. Administrative Fines
14. Meeting of Fuel Standards Committee

ENDNOTES

DRAFT

In exercise of the powers conferred by sections 9A and 9B of the Dangerous Substances Act (2017 Revision), the Office, in conjunction with the Fuel Standards Committee, makes the following Standards -

### 1. Citation

These Standards may be cited as the Fuel Quality Standards 20XX.

### 2. Commencement

The Standards will come into effect on [D] [M] 20XX.

### 3. Definitions

“the **Act**” means the Dangerous Substances Act (2017 Revision).

“**Antiknock Index (AKI)**” means the arithmetic average of the Research Octane Number (RON) and Motor Octane Number (MON):  $AKI = (RON+MON)/2$ . This value is called by a variety of names, in addition to antiknock index, including: octane rating, posted octane, (R+M)/2 octane;

“**ASTM (ASTM International)**” means the international voluntary consensus standards organization formed for the development of standards on characteristics and performance of materials, products, systems, and services, and the promotion of related knowledge;

“**Automotive Fuel Rating**” means the automotive fuel rating required under the amended Automotive Fuel Ratings, Certification and Posting Rule (or as amended, the Fuel Rating Rule), of the Codes of Federal Regulations 16 CFR Part 306.

“**Aviation Gasoline (AvGas)**” means a type of gasoline suitable for use as a fuel in an aviation spark-ignition internal combustion engine;

“**Aviation Turbine Fuel (AvJet)**” means a refined middle distillate suitable for use as a fuel in an aviation gas turbine internal combustion engine;

“**Biodiesel**” means a fuel comprised of at least 99 % by volume mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats, designated B100 or B99;

“**Biodiesel Blend**” means a fuel comprised of a blend of biodiesel with hydrocarbon diesel fuel;

“**Cetane Number**” means a numerical measure of the ignition performance of a diesel fuel obtained by comparing it to reference fuels in a standardized engine test;

“**Chief Fuels Inspector**” as defined in Dangerous Substance Act (2017 Revision);

“**Compressed Natural Gas (CNG)**” means natural gas which has been compressed and dispensed into fuel storage containers and is suitable for use as an engine fuel;

“**DEH**” means the Cayman Islands Department of Environmental Health;

“**DOE**” means the Cayman Islands Department of Environment;

“**Denatured Fuel Ethanol**” means an ethanol blend component for use in gasoline-ethanol blends and ethanol flex fuel. The ethanol is rendered unfit for beverage use by the addition of denaturants under formulas approved by the Fuel Standards Committee, by the latest version of ASTM D4806, “Standard Specification for Denatured Fuel Ethanol for Blending with Gasolines for Use as Automotive Spark Ignition Engine Fuel” which describes the acceptable denaturants for denatured fuel ethanol to be blended into spark ignition engine fuels;

“**Diesel Exhaust Fluid (DEF)**” means a preparation of aqueous urea [(NH<sub>2</sub>)<sub>2</sub>CO], containing 32.5 % by mass of technically-pure urea in high-purity water with quality characteristics defined by the latest version of ISO 22241, “Diesel engines – NO<sub>x</sub> reduction agent AUS 32.”;

“**Diesel Fuel**” means a refined hydrocarbon suitable for use as a fuel in a compression-ignition diesel internal combustion engine that may contain a combination of biodiesel, renewable diesel, and fuel additives;

“**Distillate**” means any product obtained by condensing the vapours given off by boiling petroleum or its products;

“**EN**” means the European Standards;

“**Engine Fuel**” means any liquid or gaseous matter used for the generation of power in an internal combustion engine;

“**Engine Fuels Designed for Special Use**” means Engine fuels designated by the Fuel Standards Committee as requiring registration. These fuels normally do not have ASTM or other national consensus standards applying to their quality or usability; common special fuels are racing fuels and those intended for agricultural and other off-road applications;

“**EPA**” means the United States Environmental Protection Agency;

“**Ethanol**” (Also known as “ethyl alcohol”) means ethanol that is provided in gasoline-ethanol blends by blending denatured fuel ethanol;

“**Ethanol Flex Fuel**” means blends of ethanol and hydrocarbons restricted for use as fuel in ground vehicles equipped with flexible-fuel spark-ignition engines;

“**Fuel**” means the same as the definition in the Dangerous Substances Regulations (2022 Revision);

“**Fuel Additive**” means A material added to a fuel in small amounts to impart or enhance desirable properties or to suppress undesirable properties;

“**Fuel Oil**” means refined oil middle distillates, heavy distillates, or residues of refining, or blends of these, suitable for use as a fuel for heating or power generation;

“**Fuel Standards Committee (FSC)**” means the Fuel Standards Committee established under section 9A of the Dangerous Substances Act (2017 Revision) chaired by the Chief Fuels Inspector;

“**Gallon**” means an Imperial Gallon, which is the equivalent of 4.55 litres or 1.20 US Gallons;

“**Gasoline (Petrol)**” means a volatile mixture of liquid hydrocarbons containing small amounts of additives suitable for use as a fuel in a spark-ignition internal combustion engine;

“**Gasoline-Oxygenate Blend**” means a fuel consisting primarily of gasoline along with a substantial amount (more than 1 % by volume oxygenate, not to exceed the total oxygen content);

“**Internal Combustion Engine**” means a device used to generate power by converting chemical energy bound in the fuel via spark-ignition or compression ignition combustion into mechanical work to power a vehicle or other device;

“**International Organization for Standardization (ISO)**” means the independent international organization with a membership of national standards and bodies;

“**Lead Substitute Additive Importer**” means a fuel importer who adds a lead substitute additive to their fuel intended for sale.

“**Lead Substitute**” means an EPA-registered gasoline additive suitable, when added in small amounts to fuel, to reduce or prevent exhaust valve recession (or seat wear) in automotive spark-ignition internal combustion engines designed to operate on leaded fuel;

“**Lead Substitute Engine Fuel**” means, for labelling purposes, a gasoline or gasoline-oxygenate blend that contains a “lead substitute”;

“**Liquefied Natural Gas (LNG)**” means natural gas that has been liquefied at – 162 °C (– 260 °F) and stored in insulated cryogenic tanks for use as an engine fuel;

“**Liquefied Petroleum Gas (LPG)**” means a mixture of normally gaseous hydrocarbons, predominantly propane, or butane, or both, that has been liquefied by compression or cooling, or both to facilitate storage, transport, and handling;

“**Low Temperature Operability**” means A condition which allows the uninterrupted operation of a diesel engine through the continuous flow of fuel throughout its fuel delivery system at low temperatures. Fuels with adequate low temperature operability characteristics could avoid wax precipitation and clogging in fuel filters;

**“Lubricity”** means a qualitative term describing the ability of a fluid to affect friction between, and wear to, surfaces in relative motion under load;

**“Motor Octane Number”** means a numerical indication of a spark-ignition engine fuel’s resistance to knock obtained by comparison with reference fuels in a standardized ASTM D2700, “Standard Test Method for Motor Octane Number of Spark-Ignition Engine Fuel”;

**“MTBE”** means Methyl tertiary-butyl ether, the chemical compound  $(\text{CH}_3)_3\text{COCH}_3$  [ $\text{C}_5\text{H}_{12}\text{O}$ ];

**“Natural Gas”** means a mixture of naturally occurring hydrocarbons, primarily methane, that exist in a gaseous phase in underground reservoirs and remains as a gas at atmospheric pressure.

**“Office”** means the Utility Regulation and Competition Office established under section 4 of the Utility Regulation and Competition Act (as revised);

**“Oxygenate”** means an oxygen-containing, ashless, organic compound, such as an alcohol or ether, which can be used as a fuel or fuel supplement;

**“Racing Gasoline”** means a specialty fuel typically used in non-road racing vehicles that is generally of lower volatility, has a narrower boiling range and a higher octane rating than gasolines made for use in conventional passenger vehicles;

**“Research Octane Number (RON)”** means a numerical indication of a spark-ignition engine fuel’s resistance to knock obtained by comparison with reference fuels in a standardized in the latest version of ASTM D2699, “Standard Test Method for Research Octane Number of Spark-Ignition Engine Fuel.”

**“SAE (SAE International)”** means a technical organization for engineers, scientists, technicians, and others who cooperate closely in the engineering, design, manufacture, use, and maintainability of self-propelled vehicles;

**“Thermal Stability”** means the ability of a fuel to resist the thermal stress which is experienced by the fuel when exposed to high temperatures in a fuel delivery system. Such stress can lead to the formation of insoluble gums or organic particulates. Insolubles (e.g., gums or organic particulates) can clog fuel filters and contribute to injector deposits;

**“Unleaded”** means, when used in conjunction with “engine fuel” or “gasoline”, any gasoline or gasoline-oxygenate blend to which no lead or phosphorus compounds have been intentionally added and which contains not more than 0.013 g of lead per litre (0.059 g lead per gallon) and not more than 0.0013 g of phosphorus per litre (0.0059 g phosphorus per gallon);

**“Water Authority Cayman”** means Water Authority established under section 3 of the Water Authority Act (2022 Revision); and



**“Wholesale Purchaser”** means any person who is not an ultimate consumer of gasoline, ethanol-blend fuel, diesel fuel, biodiesel, biodiesel blends, kerosene, aviation turbine fuels, natural gas, compressed natural gas, or liquefied petroleum gas and who purchases or obtains the product from a supplier.

#### 4. Application

4.1. The relevant markets in which fuels are imported and marketed to which the Standards apply are:

- i. The entire fuel sector, including the various segments and relevant markets within the sector for which the applicable fuels outlined in Section 6 are sold or marketed. The Standards apply uniformly to all three Islands of the Cayman Islands.
- ii. Aviation Turbine Jet Fuel (AvJet) and Aviation Gasoline (AvGas) shall continue to conform to the obligations relating to fuel standards for such fuels, to which they must conform to under International Air Transport Association (IATA), Joint Inspection Group (JIG) 1 & 2 Standards and Article 162 of the Air Navigation (overseas territories) Order 2013 (as amended).
- iii. For the avoidance of doubt, all other fuels supplied to the aviation sector other than AvJet and AvGas shall conform to the Standards.

4.2. The Standards shall apply to the following fuels which are defined under Section 6 and marketed in the relevant markets set out under Section 9. Further, the grades of applicable fuel shall be defined in the manner **as the minimum AKI for the particular grade** as set out below:

- i. Gasoline – Regular Grade - **AKI 87 (including Ethanol Blends up to 10%)**
- ii. Gasoline – Mid Grade - **AKI 89 (including Ethanol Blends with 5% - 10%)**
- iii. Gasoline – Super Grade - **AKI 91 (including Ethanol Blends up to 15%)**
- iv. Diesel – Monograde Ultra Low Sulphur (including Biodiesel Blends up to 20%)
- v. Liquefied Petroleum Gas – Propane HD 5
- vi. Racing Gasoline

#### 5. Exempted Fuels

All other fuels not defined under Section 4 and not listed under Section 6 shall remain exempted. The quality of exempted fuel shall be subject to the import permit regime or as determined from time to time by the FSC.

#### 6. Standards and Specifications for Fuels

The standards and specifications in this Section shall conform with the ASTM standards and testing methods or such other standards and testing methods as included in this Section, or with such equivalent standards and testing methods, as approved by the Chief Fuels Inspector or in consultation with Fuel Standards Committee.

The test methods in this Section shall be used to determine the compliance of the fuel with the standards and specifications.

The testing methods listed are the methods that will be used by inspectors and other persons authorised to conduct tests on fuel under the Act to determine whether the fuel complies with the relevant fuel standard. The acceptance of the results is at the discretion of the Chief Fuels Inspector.

(1) Gasoline

- (a) In relation to any parameter in the following table, gasoline must comply with the specification for that parameter.
- (b) Compliance with the specification for a parameter is determined by using the testing method for that parameter listed in the table.
- (c) Specifications set out in the table apply to all grades of gasoline unless otherwise stated.
- (d) Any ethanol component of gasoline must comply with the fuel standard for ethanol in subsection 6.2.
- (e) Compounds containing phosphorous must not be added to gasoline.

Item	Parameter	Specification	Testing Method
	Aromatics	<del>45% v/v maximum with a 42% v/v maximum pool average across all grades</del> -	ASTM D1319
		<del>45% v/v maximum with a 35% v/v maximum pool average across all grades</del>	
	Benzene	1.0% v/v maximum	ASTM D3606
	Copper corrosion—3 h at 50°C	Class 1	ASTM D130
	Density @ 15°C	710 – 780 kg/m <sup>3</sup>	ASTM D4052
	Diisopropyl ether (DIPE, CAS no. 108-20-3)	1% v/v maximum	ASTM D4815
	Distillation—final boiling point	225°C 240°C maximum	ASTM D86

Item	Parameter	Specification	Testing Method
	Driveability Index @69 kpa	591°C maximum	ASTM D4814
	Ethanol	10% v/v maximum	ASTM D4815
	Ethyl tertiary butyl ether (ETBE, CAS no. 637-92-3)	1% v/v maximum	ASTM D4815
	Existent washed gum	5 mg/100 mL maximum	ASTM D381
	Induction oxidation @100°C	period— 240 360—minutes minimum stability	ASTM D525
	Lead	2.5mg/L - 25mg/L maximum 5—mg/L	ASTM D3237
	Manganese	0 mg/L maximum	ASTM D3831
	Methyl tertiary butyl ether (MTBE, CAS no. 1634-04-4)	1% v/v maximum	ASTM D4815
	Motor octane number (MON)	AKI 87 - 82 MON min 91—RON grade: 81.0 AKI 89 - 83 MON min 95—RON grade: AKI 91 - 86 MON min AKI 93 - 87 MON min 85.0 minimum	ASTM D2700
	Olefins	18% v/v maximum	ASTM D1319
	Oxygen	Gasoline without ethanol: 2.7% m/m maximum Gasoline with ethanol: 3.9% m/m maximum	ASTM D4815
	Phosphorous	1.3 mg/L maximum	ASTM D3231
	Research octane number (RON)	AKI 87 - 92 RON min AKI 89 - 95 RON min AKI 91 - 95 RON min AKI 93 - 97 RON min —91 RON grade: 91.0 minimum	ASTM D2699

Item	Parameter	Specification	Testing Method
		95 RON grade: 95.0 minimum	
	Sulphur	Between commencement and 30 June 2027: 91 RON grade: <del>80</del> 150 mg/kg maximum 95 RON grade: 50 mg/kg maximum	ASTM D5453
		On and from 1 July 2027: All grades: 10 mg/kg maximum	
	Tertiary butyl alcohol (TBA, CAS no. 75-65-0)	0.5% v/v maximum	ASTM D4815
	Vapour Pressure for Petroleum Products	34 – 103 kpa	ASTM D323 & D5101

A – To be reported by the certified lab

(2) Ethanol

- (a) In relation to any parameter in the following table, ethanol in gasoline must comply with the specification for that parameter.
- (b) Compliance with the specification for a parameter is determined by using the testing method for that parameter listed in the table.
- (c) The denaturant component of ethanol must be gasoline.

Item	Parameter	Specification	Testing Method
	Acidity—as acetic acid	<del>0.006%—m/m</del> <b>200 mg/kg maximum</b>	ASTM D7795
	Appearance	Clear and bright and visibly free of suspended or precipitated contaminants	ASTM D4806
	Copper	0.1 mg/kg maximum	EN 15837 (as modified in CEN/TS 15293)

Item	Parameter	Specification	Testing Method
	Denaturant	1–1.5% v/v denaturant	ASTM D5501
	Ethanol	<b>93% of mass</b> <del>95.6% v/v</del> minimum	ASTM D5501
	Inorganic chloride	10 mg/kg maximum	ASTM D7328
	Methanol	0.5% v/v maximum	ASTM D5501
	pHe	6.5–9.0	ASTM D6423
	Solvent washed gum	5.0 mg/100 mL maximum	ASTM D381
	Sulphate	4.0 mg/kg maximum	ASTM D7328
	Sulphur	<b>20mg/kg</b> <del>10 mg/kg</del> maximum	ASTM D5453
	Water	1.0% m/m maximum	ASTM E1064

DRAFT

## (3) Diesel Fuel

- (a) In relation to any parameter in the following table, diesel must comply with the specification for that parameter.
- (b) Compliance with the specification for a parameter is determined by using the testing method for that parameter listed in the table.
- (c) Specifications set out in the table apply to all types of diesels unless otherwise stated.
- (d) Any biodiesel component of diesel must meet the requirements of the fuel quality standard for biodiesel set out in the Standards for Biodiesel.

Item	Parameter	Specification	Testing Method
	Ash	0.01% m/m maximum	ASTM D482
	Biodiesel	<b>7.0%</b> <del>5.0%</del> v/v maximum	<b>ASTM D7371</b> EN 14078
	Carbon residue—10% distillation residue	<del>0.2%</del> <b>0.1%</b> m/m maximum	ASTM D4530
	Cetane number	46 minimum	ASTM D613
	Cetane index	46 minimum	ASTM D976
	Conductivity at ambient temperature	Diesel held by a terminal or refinery for sale or distribution: 50 pS/m minimum at ambient temperature	ASTM D2624

Item	Parameter	Specification	Testing Method
	Copper corrosion—3 h at 50°C	Class 1	ASTM D130
	Density at 15°C	820–850 kg/m <sup>3</sup>	ASTM D1298
	Derived cetane number	Diesel containing biodiesel: 51 minimum	ASTM D6890
	Distillation— <del>T90 T95</del>	<del>360°C maximum</del> <b>282°C - 360°C</b>	ASTM D86
	Flash point	61.5°C <del>minimum</del> <b>maximum</b>	ASTM D93
	Filter blocking tendency	2.0 maximum	<del>IP 387 &amp; ASTM 2068</del>
	Kinematic viscosity	2.0–4.5 mm <sup>2</sup> /s at 40°C	ASTM D445
	Lubricity	460 µm maximum	ASTM D6079
	Oxidation stability	2.5 mg/100 mL maximum	ASTM D2274
	Polycyclic aromatic hydrocarbons (PAH)	11% m/m maximum	<b>ASTM D6591</b> — <del>IP 394</del>
	Sulphur	<del>10</del> <b>15</b> mg/kg maximum	ASTM D5453
	Water and sediment	0.05% v/v maximum	ASTM D2709
		Diesel containing biodiesel: 200 mg/kg maximum	ASTM D6304

(4) Biodiesel

- (a) In relation to any parameter in the following table, biodiesel must comply with the specification for that parameter.
- (b) Compliance with the specification for a parameter is determined by using the testing method for that parameter listed in the table.

Item	Parameter	Specification	Testing Method
	Acid value	0.50 mg KOH/g maximum	ASTM D664
	Carbon residue—10% distillation residue	0.30% m/m maximum	ASTM D4530
	Cold soak filterability	360 seconds maximum	ASTM D7501
	Copper corrosion—3 h at 50°C	Class 1 maximum	ASTM D130
	Density at 15°C	860–900 kg/m <sup>3</sup>	ASTM D1298

Item	Parameter	Specification	Testing Method
	Derived cetane number	51.0 minimum	ASTM D6890
	Distillation—T90	360°C maximum	ASTM D1160
	Ester content	96.5% m/m minimum	EN 14103
	Flash point	120.0°C minimum	ASTM D93
	<b>Filter blocking tendency</b>	<b>2.0 maximum</b>	<b>ASTM 2068</b>
	Glycerides—monoglycerides	0.7% m/m maximum	ASTM D6584
	Glycerides—diglycerides	0.2% m/m maximum	ASTM D6584
	Glycerides—triglycerides	0.2% m/m maximum	ASTM D6584
	Glycerol—free	0.020% m/m maximum	ASTM D6584
	Glycerol—total	0.250% m/m maximum	ASTM D6584
	Kinematic viscosity at 40°C	3.5–5.0 mm <sup>2</sup> /s	ASTM D445
	Metals—Group I—Na, K	5 mg/kg maximum	EN 14538
	Metals—Group II—Ca, Mg	5 mg/kg maximum	EN 14538
	Methanol	0.20% m/m maximum	EN 14110
	Oxidation stability at 110°C	8.0 hours minimum	EN 14112
	Phosphorus	4.0 mg/kg maximum	EN 14107
	Sulphated ash	0.020% m/m maximum	ASTM D874
	Sulphur	10 mg/kg maximum	ASTM D5453
	Total contamination	24 mg/kg maximum	EN 12662
	Water	500 mg/kg maximum	ASTM D6304

## (5) Propane/Autogas

(a) In relation to any parameter in the following table, propane must comply with the specification for that parameter.

(b) Compliance with the specification for a parameter is determined by using the testing method for that parameter listed in the table.

Item	Parameter	Specification	Testing Method
	Copper Corrosion	Class 1	EN ISO 6251
	<b>Copper, corrosion, strip max</b>	<b>No. 1</b>	<b>ASTM D1838<sup>M</sup></b>
	Denies	0.3% molar maximum	ISO 7941
	Hydrogen sulfide	Negative	EN ISO 8819

Item	Parameter	Specification	Testing Method
	Hydrogen sulphide	Pass	ASTM D2420
	Motor octane number (MON)	90.5 minimum	Composition by ISO 7941
	Odour	Detectable in air at 20% lower flammability limit	EN 589 Annex A
	Ethyl Mercaptan	Detectable my smell	Human smell detection
	Butane and heavier F,	2.5% by volume, max	ASTM D2163
	Residue on evaporation	60mg/kg maximum	JLPGA-S-03 by mass at 105°C
	Residue on evaporation of 100mL,	0.05mL max	ASTM D2158 <sup>K</sup>
	Sulfur after stenching	50mg/kg maximum	ASTM D6667
	Sulphur	185mg/Kg <sup>N</sup> max	ASTM D6667
	Vapour pressure gauge, at 40°C	800 – 1,530 kpa	ISO 8973
	Vapour pressure at 37.8°C	1435kPa <sup>B</sup> max.	ASTM D1267 <sup>D</sup> or D2598 or D6897
	Volatile residues – C5 and higher	2.0% molar maximum	ISO 7941
	Water	Pass	EN 15469
	Density at 15°C or relative density at 15.6°C/15.6°C	<sup>L</sup>	ASTM D1657 or D2598
	Moisture Content	Pass	ASTM D2713

B – Note that the total pressure of a batch of LPG can be higher than the vapour pressure determined by Practice D2598 if there are any inert gases (such as nitrogen or carbon dioxide) present in the LPG. Test Method D2598 is a calculation method of the vapour pressure of all hydrocarbons identified in a batch of LPG by Test Method D2163, but this gas chromatographic method does not detect the presence of inert gases, if present, in a batch of LPG.

D – In case of dispute about the vapour pressure of a product, the value actually determined by Test Method D1267 shall prevail over the value calculated by Practice D2598 or measured by Test Method D6897.

F – Butane and heavier includes all hydrocarbons (including olefins) with 4 or more carbon atoms

K – In the case of dispute, Test Method D2158 shall be the referee test method.

L – Although not specific requirement, the density or relative density can be needed for the other purposes and should be reported

M – This method may not accurately determine the presence of reactive material (for example, H<sub>2</sub>S, S<sup>o</sup>) in liquefied petroleum gas if the product contains corrosion inhibitors or other chemicals which diminish the reaction with copper strip.

N – The total sulphur limits in these specifications do include sulphur compounds used for stanching purposes.

## (6) Gasoline and Gasoline-Oxygenate Blends

(a) Gasoline and Gasoline-Oxygenate Blends (as defined in this document) shall meet the latest version of ASTM D4814, “Standard Specification for Automotive Spark-Ignition Engine Fuel” except for the permissible offsets for ethanol blends as provided in Section 4 (2).

(b) Gasoline-Ethanol Blends.



- I. The maximum concentration of oxygenates contained in gasoline-oxygenate blends shall not exceed those permitted by the FSC in accordance with EPA rules under Section 211 of the US Clean Air Act and applicable waivers, as adopted by FSC.
- II. Gasoline-Ethanol Blends. – When gasoline is blended with denatured fuel ethanol, the denatured fuel ethanol shall meet the latest version of ASTM D4806, “Standard Specification for Denatured Fuel Ethanol for Blending with Gasolines for Use as Automotive Spark-Ignition Engine Fuel,” and the blend shall meet the latest version of ASTM D4814, “Standard Specification for Automotive Spark-Ignition Engine Fuel,” with the following permissible exceptions.
- III. The maximum vapor pressure shall not exceed the latest version of ASTM D4814, “Standard Specification for Automotive Spark-Ignition Engine Fuel,” limits by more than 1.0 psi for blends as allowed by the FSC.
- IV. Minimum Antiknock Index (AKI). – The AKI shall not be less than the AKI posted on the product dispenser or as certified on the invoice, bill of lading, shipping paper, or other documentation.
- V. Minimum Motor Octane Number. – The minimum motor octane number shall not be less than 82 for gasoline with an AKI of 87 or greater.
- VI. Lead Substitute Gasoline. – Where lead substitutes are approved by the FSC, Gasoline and gasoline-oxygenate blends sold as “lead substitute” gasoline shall contain a lead substitute which provides protection against exhaust valve seat recession equivalent to at least 0.026 g lead per litre (0.118 g lead per Gallon).

(7) Documentation of Exhaust Valve Seat Protection. – Upon the request of the FSC, the lead substitute additive importer shall provide documentation to the FSC that demonstrates that the treatment level recommended by the additive manufacturer provides protection against exhaust valve seat recession equivalent to or better than 0.026 g lead per litre (0.118 g lead per Gallon) The FSC may review the documentation and approve the lead substitute additive before such additive is blended into gasoline.

(8) Blending. – Lead substitute and unleaded gasoline-oxygenate blends shall be blended according to the EPA “substantially similar” rule, or an EPA waiver adopted by the FSC. The term "substantially similar" is used in the Clean Air Act (USA) to distinguish which fuels and fuel additives are prohibited by EPA.

(9) Diesel Fuel. – Shall meet the following requirements, based on the biodiesel concentration of the fuel:

- (a) Diesel fuel that contains less than or equal to 5 % by volume biodiesel shall meet the latest version of ASTM D975, “Standard Specifications for Diesel Fuels” and shall be sold as diesel fuel.

- (b) Diesel fuel that contains greater than or equal to 6 % by volume biodiesel and that contains less than or equal to 20 % by volume shall meet the latest version of ASTM D7467, “Standard Specifications for Diesel Fuel Oil, Biodiesel Blend (B6 to B20)”.
- (c) Only fuel additives registered with the Fuel Standards Committee **may be used to additize diesel** fuel, and the final product shall meet the latest version of ASTM D975 and/or ASTM D7467.

(10) Premium Diesel Fuel. – All diesel fuels identified on retail dispensers as premium, super, supreme, or premier must conform to the following minimum requirements:

- (a) Cetane Number. – A minimum cetane number of 47.0 as determined by the latest version of ASTM D613, “Standard Test Method for Cetane Number of Diesel Fuel Oil.”

**NOTE:** ASTM D613, “Standard Test Method for Cetane Number of Diesel Fuel Oil” is the referee method; however, the following methods can be used to determine cetane number: the latest version of ASTM D6890, “Standard Test Method for Determination of Ignition Delay and Derived Cetane Number” (DCN) of Diesel Fuel Oils by Combustion in a Constant Volume Chamber”; and ASTM D7668, “Standard Test Method for Determination of Derived Cetane Number (DCN) of Diesel Fuel Oils—Ignition Delay and Combustion Delay Using a Constant Volume Combustion Chamber Method.”

- (b) Low Temperature Operability. – A cold flow performance measurement which meets the latest version of ASTM D975, “Standard Specification for Diesel Fuel,” tenth percentile minimum ambient air temperature charts and maps by the latest version of either ASTM D2500, “Standard Test Method for Cloud Point of Petroleum Products and Liquid Fuels” or ASTM D4539, “Standard Test Method for Filterability of Diesel Fuels by Low Temperature Flow Test, (LTFT).” The latest version of ASTM D6371, “Standard Test Method for Cold Filter Plugging Point of Diesel and Heating Fuels” may be used when the test results are a maximum of 6 °C below the Cloud Point. Low temperature operability is only applicable October 1 to March 31 of each year.

- (c) Lubricity. – A maximum wear scar diameter of 460 micrometres (µm) as determined by the latest version ASTM D6079, “Standard Test Method for Evaluating Lubricity of Diesel Fuels by the High-Frequency Reciprocating Rig (HFRR).”

**NOTE:** The latest version of ASTM D6079, “Standard Test Method for Evaluating Lubricity of Diesel Fuels by the High-Frequency Reciprocating Rig (HFRR)” is the referee method; however, the latest version of ASTM D7688, “Standard Test Method for Evaluating Lubricity of Diesel Fuels by the High-Frequency Reciprocating Rig (HFRR) by Visual Observation” can be used.

- (d) Corrosion. – A minimum rating of B+ as determined by the latest version of National Association of Corrosion Engineers (‘NACE’) TM0172, “Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines.”

*NOTE:* The latest version of National Association of Corrosion Engineers NACE TM0172 “Determining Corrosive Properties of Cargoes in Petroleum Product Pipelines” is the referee method. The latest version of ASTM D7548 “Standard Test Method for Determination of Accelerated Iron Corrosion in Petroleum Products” can be used.

(e) Filter Blocking Tendency (FBT). – A maximum of 2.2 by the latest version of ASTM D2068, “Standard Test Method for Determining Filter Blocking Tendency”, following procedure B.

(f) Injector Deposit Control. – Maximum power loss in keep-clean mode of 2 % by the latest version of Coordinating European Council, CEC F-98-08, “Direct Injection, Common Rail Diesel Engine Nozzle Coking Test.”

g. Thermal Stability. – The latest version of ASTM D6468, “Standard Test Method for High Temperature Stability of Middle Distillate Fuels” (180 min, 150 °C).

(11) Use of Other Diesel Terminology. – For any terms other than premium, super, supreme, or premier included in the diesel fuel product or grade name and/or advertisements and claims displayed on dispensers, pump toppers, pole signs and bollard signs which imply improved performance, the product must have a clearly-defined fuel property with a substantiated functional benefit. Such property must be measurable utilizing industry accepted test methodologies developed by recognized standards organizations such as ASTM, SAE, and Coordinating European Council (CEC) to allow verification of the improved performance.

(12) Liquefied Petroleum (LP) Gases. – Shall meet the latest version ASTM D1835, “Standard Specification for Liquefied Petroleum (LP) Gases.”

**NOTE:** Also reference Gas Processors Association 2140, *Liquefied Petroleum Gas Specification and Test Methods*.

(13) Racing Gasoline. – Shall meet the following requirements:

(a) the Minimum Antiknock Index (AKI) shall not be less than the AKI posted on the product dispenser or as certified on the invoice, bill of lading, shipping paper, or other documentation.

the product specification limits shall be those as declared by the manufacturer’s product specifications. Upon the request of the Chief Fuels Inspector, each importer of racing gasoline shall provide a copy of the manufacturer’s product specifications. Biodiesel Blendstock – Biodiesel intended for blending with diesel fuel shall meet the latest version of ASTM D6751, “Standard Specification for Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels.” Any blend stock less than 99 % by volume (no more than 1% by volume diesel oil) shall not be used as a commercial blend stock for biodiesel blends without the permission of the Chief Fuels Inspector.

(14) Diesel Exhaust Fluid (DEF). – Shall meet the latest version of the ISO 22241, “Diesel engines – NO<sub>x</sub> reduction agent AUS 32.”

## 7. Reproducibility Limits

AKI Limits. – When determining the antiknock index (AKI) acceptance or rejection of a gasoline sample, ~~the latest version of ASTM D3244, “Standard Practice for Utilization of Test Data to Determine Conformance with Specifications,” shall be used to determine the acceptance or rejection of the sample.~~

~~AKI reproducibility limits as outlined in the latest version of ASTM D4814, “Standard Specification for Automotive Spark-Ignition Engine Fuel.”~~

(2) Reproducibility. – The reproducibility limits of ~~a the~~ standard test method ~~used for each test performed~~ shall be acknowledged for enforcement purposes, except as indicated for Premium Diesel Fuel and AKI ~~Limits~~.

(3) Dispute Resolution. – In the event of a dispute over a reported test value, the guidelines presented in the latest version of ASTM D3244, “Standard Practice for Utilization of Test Data to Determine Conformance with Specifications,” shall be used to determine the acceptance or rejection of the sample.

(4) Enforcement Action. – The Chief Fuels Inspector may initiate enforcement action ~~if the agreed acceptable limits (AL) as determined by the process outlined in ASTM D3244 has not been met. revised, based upon a statistically significant number of samples, the average test result for products sampled from the same source location is greater than the legal maximum or less than the legal minimum limits (specification value), posted values, certified values, or registered values.~~

## 8. Condemnation and Requalification of Fuel

(1) Where a fuel is deemed to not have met the minimum specifications standard of the relevant grade of fuel under Section 6, Section 7(3) shall apply.

(2) Stop-Sale Order at Retail. – A stop-sale order may be issued to retail establishment dealers for fuels failing to meet specifications or when a condition exists that causes product degradation. A release from a stop-sale order will be awarded only after final disposition has been agreed upon by the Chief Fuels Inspector. Confirmation of disposition shall be submitted in writing on form(s) provided by the Chief Fuels Inspector and contain an explanation for the fuel’s failure to meet specifications. Upon discovery of fuels failing to meet specifications, meter readings and physical inventory shall be taken and reported in confirmation for disposition.

(3) Stop-Sale Order at Terminal or Bulk Plant Facility. – A stop-sale order may be issued when products imported or held in storage or maintained at terminals or bulk plant facilities fail to meet specifications or when a condition exists that may cause product degradation. The terminal or bulk storage plant shall immediately notify all customers that received those product(s) and make any arrangements necessary to replace or adjust to specifications those product(s). A release from a stop-sale order will be awarded only after final disposition has been agreed upon by the Chief Fuels Inspector. Confirmation of disposition of products shall be made available in writing to the Chief Fuels Inspector.

(4) Where an applicable fuel is determined not to meet the standards as set out in Section 6, the Operator shall set out in writing, the process and method to requalify and

recertify or dispose of the fuel ~~or downgraded to a lower grade. so that it conforms to the Standards.~~

(5) In consideration of an application by an Operator to be granted permission to requalify ~~fuel or to downgrade the fuel~~ which is deemed to have not met the minimum Fuel Standards, the Chief Fuels Inspector in consultation with FSC shall set out in writing, the minimum information it requires to grant its approval.

(6) Where a fuel cannot be requalified after two attempts under this provision, the fuel shall be rejected and downgraded for disposal, ~~sale or~~ alternative use where practical, or re-export. Downgraded or rejected fuel shall be used or disposed under the strict control of the Operator as per a plan approved by Chief Fuels Inspector. The Operator shall produce a manifest of its use or disposal to the Chief Fuels Inspector within seven (7) days after its use.

#### 9. Classification and Labelling for Sale

(1) Documentation. – When products subject to these Standards are sold, an invoice, delivery note or other documentation must accompany each delivery other than a retail sale. As a minimum, this document must identify the quantity, the name of the product, the particular grade of the product, the applicable automotive fuel rating, and oxygenate type and content (if applicable), the name and address of the seller and buyer, and the date and time of the sale. Documentation must be retained at the retail establishment for a period not less than one year.

(2) Retail Dispenser Labelling. – All retail dispensing devices must identify conspicuously the type of product, the particular grade of the product, and the applicable automotive fuel rating.

(3) Grade Name. – The sale of any product under any grade name that indicates to the purchaser that it is of a certain automotive fuel rating or ASTM grade shall not be permitted unless the automotive fuel rating or grade indicated in the grade name is consistent with the value and meets the requirements of Section 6.

(4) Nozzle Requirements for Automotive Gasoline, Gasoline-Oxygenate Blends, and Diesel Fuel Dispensers. – Each retail dispensing device from which fuel products are sold shall be equipped with a nozzle spout having a diameter that conforms with the specification set out below:

- Diesel – 15/16 inches
- Gasoline – 13/16 inches (all grades including blends).

(5) Automotive Gasoline and Automotive Gasoline-Oxygenate Blends (Including Racing Gasoline).

(a) Posting of Antiknock Index Required. – Automotive gasoline and automotive gasoline-oxygenate blends shall post the minimum antiknock index in accordance with applicable regulations.

(b) Use of Lead Substitute Must be Disclosed. – Each dispensing device from which gasoline or gasoline-oxygenate blends containing a lead substitute is dispensed shall display the following legend: “Contains Lead Substitute.” The lettering of this legend shall not be less than 12.7 mm (1/2 in) in height and the colour of the lettering shall be in definite contrast to the background colour to which it is applied.

(c) Prohibition of Terms. – It is prohibited to use specific terms to describe a grade of gasoline or gasoline-oxygenate blend unless it meets the minimum antiknock index requirement shown in Table 1. Minimum Antiknock Index Requirements.

Table 1. Minimum Antiknock Index Requirements

Term	ASTM D4814
Premium, Supreme, High Test	91
Midgrade, Plus	89
Regular, Unleaded (alone)	87
Blendstock	82

**Method of Retail Sale – Disclosure of Oxygenate Type.** All automotive gasoline, gasoline-oxygenate blends, racing gasoline, or biodiesel containing more than ten (10) percentage and five (5) percentage volume percent of oxygenate for gasoline and diesel respectively must disclose the predominant oxygenate. For example, labels on packages should indicate the ester/ether content in gasoline and diesel by mass/volume as a percentage. For dispensers, the AKI and appropriate "E" or "B" designation should be posted on the front panel in a clear and conspicuous location visible from the driver's position.

~~(d) Method of Retail Sale. – Type of Oxygenate must be disclosed. All automotive gasoline or automotive gasoline-oxygenate blends or racing gasoline kept, offered, or exposed for sale, or sold at retail containing more than one volume percent oxygenate shall be identified as “with” or “containing” (or similar wording) the predominant oxygenate in the engine fuel. For example, the label may read “contains ethanol” or “with methyl tertiary butyl ether (MTBE).” The oxygenate contributing the largest mass percent oxygen to the blend shall be considered the predominant oxygenate. Where mixtures of only ethers are present, the retailer may post the predominant oxygenate followed by the phrase “or other ethers” or alternatively post the phrase “contains MTBE or other ethers.” This information shall be posted on the upper 50 % of the dispenser front panel in a position clear and conspicuous from the~~

~~driver's position in a type at least 12.7 mm ( $\frac{1}{2}$  in) in height, 1.5 mm ( $\frac{1}{16}$  in) stroke (width of type).~~

- (6) Documentation for Dispenser Labelling Purposes. – For automotive gasoline, automotive gasoline-oxygenate blends or racing gasoline, the retailer shall be provided, at the time of delivery of the fuel, product transfer documents such as an invoice, bill of lading, shipping paper, or other documentation:
- a) Information that complies with documentation requirement set out by the Chief Fuels Inspector when the fuel contains ethanol.
  - b) For fuels that do not contain ethanol, information that complies with documentation requirement set out by the Chief Fuels Inspector which shall clearly state the predominant oxygenate or combination of oxygenates present in concentrations sufficient to yield an oxygenate content of at least 1.0 % by volume in the fuel. Where mixtures of only ethers are present, the fuel supplier may identify either the predominant oxygenate in the fuel (i.e., the oxygenate contributing the largest mass percent oxygen) or alternatively, use the phrase “contains MTBE or other ethers.”
  - c) Gasoline containing more than 0.3 % by volume methanol shall be identified as “with” or “containing” methanol.
  - d) EPA Labelling Requirements. – Retailers and wholesale purchaser of gasoline shall comply with the EPA pump labelling requirements for gasoline containing greater than 10 volume percent (v%) up to 15 volume percent (v%) ethanol (E15) under 40 CFR 80.1501.
- (7) Diesel Fuel.
- (a) Labelling of Grade Required. – Diesel Fuel other than No 2-D shall be identified by grade.
  - (b) Automotive Fuel Rating. – Diesel fuel containing 6 % to 20 % by volume biodiesel shall be labelled with its automotive fuel rating specifying the maximum blend is no greater than 20% biodiesel. The FSC shall publish standards from time to time specifying the requirement for labelling of biodiesel blends.
  - (c) Delivery Documentation for Premium Diesel. – Before or at the time of delivery of premium diesel fuel, the retailer or the wholesale purchaser shall be provided on an invoice, bill of lading, shipping paper, or other documentation a declaration of all performance properties that qualifies the fuel as premium diesel fuel as required in subsection 6 (10) Premium Diesel Fuel.
- (8) Liquefied Petroleum Gas (LPG).
- (a) Liquefied petroleum gases shall be identified by grades Commercial Propane, Commercial Butane, Commercial Propane/Butane Mixtures or Special-Duty Propane (HD5).

(b) The relevant labelling requirements as specified in NFPA 58 apply.

(9) Biodiesel and Biodiesel Blends.

Biodiesel Blendstock shall be identified by the term “biodiesel” with the designation “B100” or “B99.”

(a) Labelling of Retail Dispensers.

- I. Labelling of Grade Required. – Biodiesel shall be identified by the grade B20 Diesel
- II. Automotive Fuel Rating. – Biodiesel and biodiesel blends shall be labelled with its automotive fuel rating on or near the nozzle from which the grade of fuel is dispensed.
- III. Biodiesel Blends. – When biodiesel blends greater than 5 % by volume are offered by sale, each side of the dispenser where fuel can be delivered shall have a label conspicuously placed that states “Consult Vehicle Manufacturer Fuel Recommendations.”
- IV. The lettering of this legend shall not be less than 6 mm ( $\frac{1}{4}$  in) in height by 0.8 mm ( $\frac{1}{32}$  in) stroke; block style letters and the colour shall be in definite contrast to the background colour to which it is applied.
- V. Documentation for Dispenser Labelling Purposes. – The retailer shall be provided, at the time of delivery of the fuel, a declaration of the volume percent biodiesel on an invoice, bill of lading, shipping paper, or other document. This documentation is for dispenser labelling purposes only; it is the responsibility of any potential blender to determine the amount of biodiesel in the diesel fuel prior to blending.
- VI. Exemption. – Biodiesel blends that contain less than or equal to 5 % biodiesel by volume are exempted from the requirements of subsection (12a, iii) above when it is sold as “diesel fuel”.

(10) Diesel Exhaust Fluid (DEF).

(a) DEF shall be labelled.

(b) Retail Dispenser Labelling. – A label shall be clearly and conspicuously placed on the front panel of the DEF dispenser stating, “for operation of selective catalytic reduction (SCR) converters in motor vehicles with diesel engines.”

(c) Documentation for Retailers of Bulk Product. – A DEF supplier shall provide, at the time of delivery of the bulk shipment of DEF, identification of the fluid’s origin including the name of the fluid manufacturer, the brand name, trade name, or trademark, and a statement identifying the fluid as DEF conforming to specifications given in the latest version of ISO 22241, “Diesel engines – NOx



reduction agent AUS 32.” This information shall be provided by the supplier on an invoice, bill of lading, shipping paper, or another document.

- (d) Labelling Packaged Product. – Any DEF retail package shall bear a label that includes the name of the fluid manufacturer, the brand name, trade name, or trademark, a statement identifying the fluid as DEF conforming to specifications given in the latest version of ISO 22241, “Diesel engines – NOx reduction agent AUX 32.” And the statement, “It is recommended to store DEF between – 5 °C to 30 °C (23 °F to 86 °F).”

## 10. Retail Storage Tanks and Dispenser Filters

(1) No water phase greater than 6 mm (¼ in) as determined by an appropriate detection paste or other acceptable means, is allowed to accumulate in any tank utilized in the storage of gasoline-alcohol blend, biodiesel, biodiesel blends and ethanol flex fuel.

(2) Water shall not exceed 25 mm (1 in) in depth when measured with water indicating paste or other acceptable means in any tank utilized in the storage of diesel, gasoline, gasoline-ether blends, and kerosene sold at retail.

(3) Dispenser Filters.

(a) Engine Fuel Dispensers.

- i. All gasoline, gasoline-alcohol blends, dispensers shall have a 10 micron or smaller nominal pore-sized filter.
- ii. All biodiesel, biodiesel blends, and diesel dispensers shall have a 30 micron or smaller nominal pore-sized filter.

(4) Product Storage Identification.

(a) The fill connection for any fuel product storage tank or vessel supplying engine-fuel devices shall be permanently, plainly, and visibly marked as to the product contained.

(b) When the fill connection device is marked by means of a colour code, the colour code shall be conspicuously displayed at the place of business and the colour codes as specified and agreed by the Office and Fuels Suppliers using the approved Colour-Symbol System to Identify Equipment and Transfer Points for Petroleum Fuels and Related Products at Dispensing and Storage Facilities and Distribution Terminals shall be used.

(5) Volume of Product Information.

Each retail location shall maintain on file a calibration chart or other means of determining the volume of each regulated product in each storage tank and the total capacity of such storage tank(s). If so, requested this information shall be supplied immediately to the Chief Fuels Inspector.

**11. Product Registration**

All engine fuels designed for special use that do not meet ASTM specifications or standards addressed in Section 6 Standard Specifications shall be registered with the Chief Fuels Inspector by submitting an import permit form in accordance with Regulations 30 & 31 of the Dangerous Substances Regulation (2022 Revision). The application shall be submitted to the Chief Fuels Inspector 60 days prior to the time the applicant wishes to engage in sales. The application form shall be accompanied with the following information:

- (a) Product brand name and product description; and
- (b) A product specification sheet shall be attached.

**12. General Matters Connected to Standards**

General matters related to the Standards shall be submitted to the Fuel Standard Committee in writing. The Committee shall meet to consider the submission and determine whether it requires further review and action and shall respond to such matters in writing.

**13. Administrative Fines**

Where the Office is satisfied that there are reasonable grounds for believing that an Operator may have failed to comply with or contravened one or more of the Standards, the Office may impose an administrative fine under Schedule 7 of the Dangerous Substances Regulations (2022 Revision) as revised where applicable.

**14. Meeting of Fuel Standards Committee**

The FSC shall meet at least twice annually to consider matters relating to these Standards.

## ENDNOTES

[To record publications and amendments.]

Made by the Fuel Standards Committee, Utility Regulation and Competition Office the  
[X] day of [M], 20[2X]

[X]

Chair

[END]