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GAZETTE NOTICE No. 356 of 2025

[2160521

The Energy Regulation Act (Act No. 12 of 2019)

Notice of Intention to Gazette - Guidelines for the Approval of Performance Enhancing Additives in Petroleum Fuels

MEMBERS of the General Public are hereby informed that the Energy Regulation Board (ERB) intends to Gazette Guidelines for the Approval of Performance Enhancing Additives in Petroleum Fuels, fourteen (14) days from the date of this notice in accordance with the provision of section 46 (2) of the Energy Regulation Act No. 12 of 2019.

GLOSSARY

Acid Number	-	The number of mg of potassium hydroxide (KOH) needed to neutralize all or part of the acidity of 1 g of a petroleum product. Also specifies as neutralization number (NN) or neutralization value (NV) and total acid number (TAN)
Additive	-	A substance added to a petroleum fuel with the objective of improving one or more of its properties or performance characteristics
ASTM	-	ASTM international - formerly known as the American Society for Testing and Materials (ASTM), is a globally recognized leader in the development and delivery of international voluntary consensus standards. Today, some 12,000 ASTM standards are used around the world to improve product quality, enhance safety, facilitate market access and trade, and build consumer confidence
CEC	-	The Coordinating European Council is an Industry-based organisation which develops Test Methods for the performance testing of Automotive Engine Oil, Fuels & Transmission Fluids (using gasoline & diesel engines). In addition, it covers Marine & Large Engine Oils, Two-stroke Engine Oils & Associated Bench Tests
DCA	-	Detergent Control Additive, which controls the deposit formation and prevents the deposits from forming on the fuel system components
Lubricity	-	The ability of a fluid to lubricate. It is related to film strength and can be enhanced by additive treatment
Oxidation	-	
Stability	-	The resistance of a petroleum product to oxidation. Can be determined by means of a number of accelerated tests which simulate service conditions
REACH	-	A regulation of the European Union, adopted to improve the protection of human health and the environment from the risks that can be posed by chemicals, while enhancing the competitiveness of the EU chemicals industry
FAME	-	Fatty Acid Methyl Ester
ZEMA	-	Zambia Environmental Management Agency
OMC	-	Oil Marketing Company

INTRODUCTION

The Energy Regulation Act No. 12 of 2019 mandates the Energy Regulation Board (ERB) to promote the development and use of new and appropriate technologies in the energy sector.

In line with the said mandate the ERB is cognizant of the continuous change in petroleum fuels technology worldwide. These changes are partly driven by the environmental drivers and the impact petroleum fuels in vehicles have on the atmosphere and climate change. In this light, a number of petroleum stakeholders have proposed the use of Additives in petroleum fuels (unleaded petrol and diesel) in Zambia. The ERB, through a consultative process with various stakeholders, which included members of the Petroleum Products Quality Standards Technical Committee (PPQSTC), Additives have been identified as one of the measures that play a role in the performance of vehicle engines with regards to their durability, power, fuel consumption and emissions. However, Additives need to be properly tested to ensure that they function as expected in vehicles and that they do not cause any unintended consequences. Therefore, there is need to develop criteria for approval of Additives to be used in petroleum fuels.

This paper proposes the criteria for the approval of Additives for use in the petroleum subsector in Zambia.

OBJECTIVES

The objectives of the criteria are to:

- To define the criteria to be followed before an Additive can be added into a petroleum fuel by the OMCs in the country's main fuel supply chain.
- To define additive test parameters, test methods and equipment required to carry out tests.
- To define a criterion that can be used in developing a quality standard for Additives.

BENEFITS OF ADDITIVES

Energy conservation

Fuel additives have been in use for many years and have shown their ability to perform in the internal combustion engine, optimising the efficiency, especially in modern engines, where the tolerances are very small. This has allowed for significant improvements in specific fuel consumption of vehicles, while ensuring long service life.

Fuel economy

Fuel additives can have an impact of fuel economy, essentially through keeping the fuel system clean, it can operate at the design efficiency and hence minimise the deterioration over time. Very high levels of cleanliness are required for modern high performance (efficiency) engines, making the role of Additives more important. It has also been found that a dirty engine results in increased exhaust emissions, which has a negative impact on the environment.

Enhanced safety

Reduced risk of static discharge when handling the product.

Reduced maintenance

Protection of fuel tanks and other equipment from corrosion, protection of fuel system equipment in engines from wear and stability improvement to prolong storage life.

Performance enhancement

Fuel saving from optimised vehicle performance and economy.

Environmental control

Emissions reduction from fuel system cleanliness and combustion optimisation.

SCOPE OF THE GUIDELINES

The scope of the guidelines shall cover approval criteria of multifunctional Additives which are typically used downstream of the refinery and are combined into a package that provides performance-enhancement for the petroleum fuels (including biofuels/blended fuels) in vehicles. These shall include but not limited to the following:

- Deposit control additive (DCA),
- Demulsifier,
- Corrosion inhibitor,
- Cetane Improver,
- Anti-Foam,
- Cold flow improver,
- Octane enhancers,
- Lubricity improvers, and
- Stability improvers.

Note: There is no approved list or industry body that approves the use of Additives. ZEMA does however require that Additives are 'registered' but the Agency does not test candidate products for engine efficiency, emissions benefits, or safety as part of the registration process. The chemical composition is merely registered by the Additive company. Registration does not represent the Agency's endorsement of the product.

TEST METHODS AND PERFORMANCE ASSESSMENT

Testing and Standardisation Organisations

There are essentially two internationally accepted Testing and Standards bodies which are ASTM and CEC. These bodies set standards and test procedures that are used by the entire industry to test the performance of different fuels and additives, as well as being able to discriminate between the performances of different fuels.

Engine Test Procedures

Engine test methods have been developed over numerous years to ensure that differentiation between different fuel formulations can be determined and that they are relatively repeatable and reproducible.

Performance for the whole fuel system (engine) must be tested.¹

Unleaded petrol

<i>Test type</i>	<i>Test method</i>	<i>Description</i>
Petrol Injector cleanliness test method	ASTM D5598 - Standard Test Method for Evaluating Unleaded Automotive Spark-Ignition Engine	Electronic Port Fuel Injector Fouling PFI driveability problems have been known since the early 1980's. These were due to deposits that formed on the pintle surface, reducing the flow through the orifices. This affects the air/fuel ratio and hence the combustion and driveability and increased fuel consumption. This procedure was developed so that it could be used to evaluate differences in base fuels and fuel additives
Petrol Intake valve cleanliness test method (IVD)	CEC F-05-93 - Inlet Valve Cleanliness in the MB M102E Engine	Designed to evaluate the formation of intake valve deposits (IVD) in fuel injected engines. The test cycle simulates the stop and go operation, with the inlet valve locked to prevent rotation. The ability of a gasoline or a gasoline formulation to influence deposit formation on the inlet valves is determined. The results are expressed by the weight of the deposits accumulated during the test on the intake valves and in terms of a merit rating.
	CEC F-20-98 - Deposit Forming Tendency on Intake Valves	Designed to evaluate the ability of petrol additives to prevent intake valve deposits in fuel injected engines. The engine is operated under cyclic conditions and the mass of the deposits on the valves is measured
	ASTM D5500 - Standard Test Method for Vehicle Evaluation of Unleaded Spark-Ignition Engine Fuel for Intake Valve Deposit Formation	Field testing indicated that intake valve deposits affected driveability. Testing indicated that if the IVD level was below a certain average weight per valve at the end of mileage accumulation, then that fuel could be used in the BMW vehicle-engine combination for a specified period without intake valve deposits causing driveability issues. Mileage is accumulated following a specified driving profile
	ASTM D6201 - Standard Test Method for Dynamometer Evaluation of Unleaded petrol Spark-Ignition Engine Fuel for Intake Valve Deposit Formation	The Coordinating Research Council (CRC) sponsored the testing to develop this test method to evaluate a fuel's tendency to form intake valve deposits.
Petrol no-harm test method	CEC F-16-96 - Assessment of the Inlet Valve Sticking Tendency of petrol	Designed to determine whether petrol is likely to cause inlet valve sticking

Diesel

<i>Test type</i>	<i>Test method</i>	<i>Description</i>
Diesel Injector cleanliness test method	CEC F-23-01 - Procedure for Diesel Engine Injector Nozzle Coking Test	Designed to evaluate the injector nozzle coking tendency of diesel fuels. Operated at light load/speed and with cyclic conditions. The propensity of the fuel to cause deposit formation in the injectors is determined by measuring the injector nozzle air flow before and after the test operation
	CEC F-98-08 - Direct Injection, Common Rail Diesel Engine Nozzle Coking Test	The indirect injection engine is old technology and has been replaced by more modern, direct injection, due to its better emissions (smoke), fuel economy and performance. These engines are much more sophisticated than indirect injection types, and must retain all their calibration precision in order to maintain their designed performance. The injectors are vulnerable to having their operation impaired by fouling from the deposits resulting from combustion. Hence a new test procedure has been developed that can demonstrate the potential of fuels to cause fuel injector fouling in these modern engines. New injectors are bedded-in for 16 cycles on the non-fouling DF79 fuel, test fuel is then flushed through the engine and the test is run for 8 cycles before stopping for 4 hours. This is repeated 3 times and test finishes after a further 8 cycles. The percentage power loss at Stage 12 over the 32 cycles is the final result of this test. The test can discriminate between fuels that differ in their ability to produce injector deposits. The target is to be able to discriminate between a fuel that produces no measurable deposits and one which produces deposits that cause the 2% loss in power considered unacceptable by engine manufacturers.

Laboratory Test Procedures

There are a number of different laboratory test procedures that are used to demonstrate the performance of Additives.

These are tabulated below:

<i>Test method</i>	<i>Description</i>
ASTM D665	06 standard test method for rust-preventing characteristics of inhibited mineral oil in the presence of water
ASTM D2274	10 standard test method for oxidation stability of distillate fuel oil (accelerated method)
ASTM D6079	11 standard test method for evaluating lubricity of diesel fuels by the high-frequency reciprocating rig (HFRR)
ASTM D6371/ IP 309	05(2010) standard test method for cold filter plugging point of diesel and heating fuels
ASTM D97	11 standard test method for pour point of petroleum fuels
ASTM D525	05 standard test method for oxidation stability of petrol (induction period method)
ASTM D2624	09 standard test methods for electrical conductivity of aviation and distillate fuels
ASTM D2699	11 standard test method for research octane number of spark-ignition engine fuel
ASTM D2700 -	11 standard test method for motor octane number of spark-ignition engine fuel
ASTM D613	10a standard test method for cetane number of diesel

<i>Test method</i>	<i>Description</i>
ASTM D976	Standard Test Method for Calculated Cetane Index of Distillate Fuels This test method covers the Calculated Cetane Index formula, which represents a means for directly estimating the ASTM cetane number of distillate fuels from API gravity and mid-boiling point
ASTM D7668	10 standard test method for determination of derived cetane number (DCN) of diesel

ADDITIVES PERFORMANCE EVALUATION

Additives have been used for a long time and a number of them have been extensively tested in industry accepted tests. This ensures that the Additives:

1. function as expected,
2. can differentiate the performance of one from the other,
3. cause no harm, and
4. do not negatively impact any other aspects of fuel properties or performance.

Evaluating their effectiveness is costly and extremely complex. Careful consideration should be given to legislation that may be considered in this regard. Experience from other markets has shown that rates may reduce to the point of providing less than optimal performance due to the difficulties in implementing a regulatory, as opposed to a market driven, process.

As a minimum the following should be considered:

- Standardised Engine Test Methods - Based On Real-World Conditions
- Standardised Laboratory Test Methods - Based On Real-World Conditions
- The Setting of Effective Limits - Based On Engine Tests Developed Using Sound Statistical Science with Appropriate Test Reference Fuels
- Approved Verified Accredited Test Laboratories should be used
- 16 point material safety data sheet (MSDS) should be evaluated by ZEMA to ensure that the product is safe to handle.

DOSING OF ADDITIVES

The accurate dosing of additives is critical for several reasons, including:

- (i) Cost,
- (ii) Consistency of dosing,
- (iii) Ensuring that overdosing does not occur,
- (iv) Ensuring homogeneous mixtures, and
- (v) Auditability.

Dosing of Additives shall be accurately done into the pipelines or fuel depots in line with best industry practice.

Typically, a MonoBlock metering and control manifold shall be used that has variable injection rates, depending on the flow rate. This option presents audit trail.

PROPOSED GUIDELINE FOR ACCEPTANCE OF ADDITIVES

Any Additives that are to be considered for use in petroleum fuels shall meet the following aspects and shall be documented:

Required Documentation

- (i) 16-point material safety data sheet (MSDS) that shall include but not limited to the following:
 - (a) The effect on emissions,
 - (b) The effect on the operation and durability of engines, fuel and exhaust systems and pollution control systems,
 - (c) The effect on the environment,
 - (d) The effect on human health and safety,
 - (e) The effect on the interests of consumers, and
 - (f) Shelf life (stability),
- (ii) Any relevant scientific advice and research on the Additive or class of Additives,
- (iii) The effect that the additive will have on the properties of fuel specification including long term storage stability,
- (iv) Any international regulations or international standards concerning the Additive or class of Additives,
- (v) Costs,
- (vi) Additive manufacturer's recommended dosing methodology.
- (vii) Industry standard testing, including:

- Unleaded petrol:
 - (a) Copper corrosion,
 - (b) Elastomer testing full specification testing (SANS 1598 / EN228) – comparing it to the base petrol,
 - (c) Impact or water shedding,
 - (d) Wet corrosion, and
 - (e) Emission testing (rolling road).
- Diesel:
 - (a) Common rail,
 - (b) HFRR,
 - (a) Full specification testing (SANS 342 / EN590) – comparing it to the base diesel,
 - (b) Impact or water shedding,
 - (c) Wet corrosion, and
 - (d) Emission testing (Bench / rolling road).
 - (viii) Documented field testing with controls,
 - (ix) REACH registered & Bacterial testing, if contains a fungicide, and
 - (x) All additives should be provided with sufficient industry approved testing.

Proposed test limits

Data for the following tests should be supplied in representative fuel.

Unleaded petrol (Including ethanol blends)

		Test	Hours	Proposed test limits
Required	Inlet Valve Cleanliness in the MB M102E Engine (CEC F-05-A-93)	Evaluate the propensity of petrol or petrol additive formulations to prevent intake valve deposits in fuel injected engines. The engine is operated under cyclic conditions. The results are expressed by the weight of the deposits accumulated during the test on the intake valves and in terms of the merit ratings	60	< 20 mg / valve
Alternative	Deposit Forming Tendency on Intake Valves and in Combustion Chambers of Petrol Engines (CEC F-20-A-98)	Deposit forming tendency on intake valves and combustion chambers of petrol engines. The results are expressed by the weight of the Total Combustion Deposits and that of Inlet Valve Deposits. All results are then reported in mg.	60	< 20 mg / valve
Info	Injector Fouling (GFC-CM3)	Fuel injector cleanliness test	150	Report
Info	The Evaluation of Petrol Engine Intake System Deposition (CEC F-04-A-87)	Evaluation of the performance of petrol or petrol additive formulations with respect to their influence on intake system deposit accumulation	40	Report if available
Info	Assessment of the Inlet Valve Sticking Tendency of Petrol Fuels (CEC F-16-T-96)	Determine whether a petrol fuel is likely to cause inlet valve sticking in field conditions. These deposits can cause the valve to stick in the open position.	72	Report

Laboratory tests

These tests should be conducted on the same base fuel – there should be no negative impact on the results.

Additive	Tests	Test method
Deposit Control Additive (DCA)	(i) Wet corrosion (ii) Potential and existing Gums (iii) Induction period (iv) Acid number (v) Full Specification	(i) ASTM D665 A & B (ii) ASTM D873 / D381 (iii) ASTM D525 (iv) ASTM D3242 (v) AS per Zambian Standard (ZS 395)

Note: Shelf life - no difference in Acid levels and existent gum after storing for 12 weeks at 60 °C

Diesel (Including FAME blends)

Engine tests

Test			Hours	Proposed limit
Required	Procedure for Diesel Engine Injector Nozzle Coking Test (CEC F-23-A-01)	Ability to discriminating between diesel fuels of different injector nozzle coking propensity. The propensity of the fuel to provoke deposit formation in the fuel injectors is determined by measuring the injector nozzle air flow before and after test operation.	10	<10%
Info	Bosch Diesel Fuel Lubricity (CEC F-32-X-99)	To evaluate diesel fuel lubricity associated with distributor type pumps as used in light and medium duty vehicles since they rely entirely on the fuel to lubricate the pumps. A pump rig test developed by Bosch is used for this purpose	1000	Report (if available)
Required	Ford Duratorq engine (CEC F-035)	To evaluate the injector fouling tendency in modern high speed direct injection engines fitted with rotary pumps, unit injectors and common rail systems	-	<2%
Required	Measurement of Diesel Fuel Lubricity (CEC F-06-96)	To assess the lubricating property of liquid fuels, specifically automotive diesel fuel, including those which may contain a lubricity enhancing additive, in order to assess the capacity of the fuel to minimise adhesive wear in high pressure fuel pumps used in automotive and similar applications. At the completion of the test, the specimen is put under the microscope and measure the wear scar diameter in both "X" and "Y" axes to an accuracy of plus minus 10 microns. The final reported result is the mean of the two measurements, rounded to the nearest microns	1.25	No impact (Base fuel versus additised fuel)

Laboratory tests

These tests should be conducted on the same base fuel – there should be no negative impact on the results.

Additive	Test	Test Method
Deposit Control Additive (DCA)	(i) Wet corrosion	(i) ASTM D665 A & B
	(ii) Foam	(ii) ASTM D892-13
	(iii) Water shedding	(iii) ASTM D1401
	(iv) Acid number	(iv) ASTM D3242
	(v) Oxidation stability	(v) ASTM D2274
	(vi) Full Specification	(vi) As per Zambia's standards (ZS 718)

Note: Shelf life - No difference in Acid levels and existent gum after storing for 12 weeks at 60 °C.

ENG.E.C. SICHONE (ENG),
Director General,
Energy Regulation Board

LUSAKA

GAZETTE NOTICE No. 357 OF 2025

[2160496]

The Lands and Deeds Registry Act
(Cap. 185 of the Laws of Zambia)
(Section 56)

Notice of Intention to Issue a Duplicate Certificate of Title

FOURTEEN DAYS after the publication of this notice, I intend to apply for a Duplicate Certificate of Title No. CT 1314455 in the names Sondo Sifaya in respect of Stand No. LSK 1225 in extent of 2347 Square Metres situated in the Lusaka Province of the Republic of Zambia.

All persons having objections to the issuance of the duplicate certificate of title are hereby required to lodge the same in writing with the Registrar of Lands and Deeds within fourteen days from the date of publication of this notice.

P. BOX 30069
LUSAKA

M. PIHRI,
Registrar,
Lands and Deeds.

ADVT—627—2160392

The Money-Lenders Act
(Chapter 398 of the Laws of Zambia)

Notice of Intention to Apply for a Money-Lender's Certificate

TAKE NOTICE that Danicorp Financial Services Limited of Mwinilunga District of the North-Western Province of the Republic of Zambia intends to apply for a renewal of Money-Lender's Certificate under the Money-Lender's Act Cap 398 of the Laws of Zambia at Mwinilunga before Honourable Magistrate Chinyama Nkumbwa for the year 2025 under the name Danicorp Financial Services Limited.

This application will be heard by the Subordinate Court of the First Class at Mwinilunga on the 25th day of March, 2025, at 09:00 hours.

Anybody with objection on the same should send objection to the undersigned.

MWINILUNGA

CLERK OF COURT

The Liquor Licensing Act
(Section 20 (4) and (6))

Notices of Intention to Apply for Grant or Renewal of a Liquor Licence

ADVT—628—2160680

NOTICE IS HEREBY GIVEN that ALICK NYONDO, T/A Alex's Bottle Store, of Lusaka West intends to apply to the Provincial Licensing Board of the Lusaka Province for the renewal of a Liquor Licence in respect of the premises situate at Plot No. 60 Musamba Chilanga Lusaka.

Notices and other documents may be served on the above named at the above address.

ADVT—629—2160517

NOTICE IS HEREBY GIVEN that LISTON KABWITA, T/A Kabwitas Bar, of Lusaka West intends to apply to the Provincial Licensing Board of the Lusaka Province for the renewal of a Liquor Licence in respect of the premises situate at Lusaka West.

Notices and other documents may be served on the above named at the above address.

ADVT—630—2160372

NOTICE IS HEREBY GIVEN that CHRISTOPHER KAFUMBA, T/A Quick Shine Car Wash and Liquor Store, of 199B Ibex Hill intends to apply to the Provincial Licensing Board of the Lusaka Province for the grant of a Liquor Licence in respect of the premises situate at 199B Ibex Hill Lusaka.

Notices and other documents may be served on the above named at the above address.

ADVT—395—2160564

NOTICE IS HEREBY GIVEN that FRANK DIWELL ZULU, T/A Sam's Bar and Grill, behind Choppies, Chongwe intends to apply to the Provincial Licensing Board of the Lusaka Province for the grant of a Liquor Licence in respect of the premises situate at Sam's Bar and Grill behind Choppies, Chongwe.

Notices and other documents may be served on the above named at the above address.