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FINAL DRAFT EAST AFRICAN STANDARD

Automotive biodiesel B5 fuel — Specification

EAST AFRICAN COMMUNITY

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Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in the East African Community. It is envisaged that through harmonized standardization, trade barriers that are encountered when goods and services are exchanged within the Community will be removed.

The Community has established an East African Standards Committee (EASC) mandated to develop and issue East African Standards (EAS). The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the public and private sector organizations in the community.

East African Standards are developed through Technical Committees that are representative of key stakeholders including government, academia, consumer groups, private sector and other interested parties. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the Principles and procedures for development of East African Standards.

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

The committee responsible for this document is Technical Committee EASC/TC 067, *Biofuels*.

Attention is drawn to the possibility that some of the elements of this document may be subject of patent rights. EAC shall not be held responsible for identifying any or all such patent rights.

Automotive biodiesel B5 fuel — Specification

1 Scope

This Draft East African Standard specifies requirements, sampling and test methods for automotive biodiesel B5 fuel.

This standard is applicable to a fuel blend of 5 % biodiesel and 95 % automotive diesel.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ASTM D6217, *Standard test method for particulate contamination in middle distillate fuels by laboratory filtration*

ASTM D6371, *Standard test method for cold filter plugging point of diesel and heating fuels*

ASTM D6751, *Specification for Biodiesel Fuel Blend Stock (B100) for Middle Distillate Fuels*

ASTM D7371, *Standard test method for determination of biodiesel (fatty acid methyl esters) content in diesel fuel oil using mid infrared spectroscopy (FTIR-ATR-PLS method)*

EAS 177, *Automotive Gas Oil (Automotive Diesel) — Specification*

EAS 1332, *Biodiesel (B100) fuel — Specification*

EAS 1334, *Fuel additives — Specification*

EN 12916, *Petroleum products. Determination of aromatic hydrocarbon types in middle distillates. High performance liquid chromatography method with refractive index detection*

EN 14331*, Liquid petroleum products. Separation and characterisation of fatty acid methyl esters (FAME) from middle distillate fuels. Liquid chromatography (LC)/gas chromatography (GC) method*

ISO 2049, *Petroleum products — Determination of colour (ASTM scale)*

ISO 2160, *Petroleum products — Corrosiveness to copper — Copper strip test*

ISO 2719, *Determination of flash point — Pensky-martens closed cup method*

ISO 3015, *Petroleum and related products from natural or synthetic sources — Determination of cloud point*

ISO 3104, *Petroleum products — Transparent and opaque liquids — Determination of kinematic viscosity and calculation of dynamic viscosity*

ISO 3170, *Hydrocarbon liquids — Manual sampling*

ISO 3171, *Petroleum liquids — Automatic pipeline sampling*

ISO 3405, *Petroleum and related products from natural or synthetic sources — Determination of distillation characteristics at atmospheric pressure*

ISO 3675, *Crude petroleum and liquid petroleum products — Laboratory determination of density — Hydrometer method*

ISO 3735, *Crude petroleum and fuel oils — Determination of sediment — Extraction method*

ISO 4259, *Petroleum and related products — Precision of measurement methods and results*

ISO 5165, *Petroleum products — Determination of the ignition quality of diesel fuels — Cetane engine method*

ISO 6245, *Petroleum products — Determination of ash*

ISO 6619, *Petroleum products and lubricants — Neutralization number — Potentiometric titration method*

ISO 10370, *Petroleum products — Determination of carbon residue — Micro method*

ISO 12156-1, *Diesel fuel — Assessment of lubricity using the high-frequency reciprocating rig (HFRR) — Part 1: Test method*

ISO 12205, *Petroleum products — Determination of oxidation stability of middle-distillate fuels*

ISO 12937, *Petroleum products — Determination of water — Coulometric Karl Fisher titration method*

ISO 20847, *Petroleum products — Determination of sulfur content of automotive fuels — Energy-dispersive X–ray fluorescence spectrometry*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
additive
compound added to the biodiesel fuel to improve either the performance of the biodiesel or its storage stability or both

3.2
biodiesel
fuel comprised of mono-alkyl esters of long chain fatty acids derived from plant oils, animal fats, or a combination of these feedstocks, designated as B100

3.3
dye
chemical added to fuels for visual identification

3.4
marker
substance added to fuels for traceability to protect them against theft or adulteration and also to distinguish between different fuels

4 Requirements

4.1 General requirements

4.1.1 The fuel shall comprise 5 % biodiesel (B100) and 95 % automotive diesel, complying with EAS 1332 and EAS 177, respectively.

4.1.2 Suitable additives may be used to enhance the performance characteristics of the fuel, and shall be in accordance with the requirements of EAS 1334.

4.1.3 The fuel may contain suitable dyes to impart a distinctive colour.

4.1.4 The fuel may contain small quantities of markers, which are documented as harmless.

4.1.5 The fuel shall be clear and free of visible water, sediment, suspended matter and any other contaminant. It shall remain homogeneous during storage and not exhibit phase separation.

4.2 Specific requirements

The fuel shall comply with the requirements given in Table 1 when tested in accordance with the test methods specified therein.

Table 1 — Requirements for automotive biodiesel B5 fuel

S/N	Property		Requirement	Test method
i.	FAME content[a]		5 ± 0.5	ASTM D7371
ii.	Density, kg/m^3 • At 15 ºC • At 20 ºC		 820 – 870 820 – 850	ISO 3675
iii.	Kinematic viscosity at 40 ºC, mm^2/s		2.0 – 5.0	ISO 3104
iv.	Flash point, ºC, min.		60	ISO 2719
v.	Sulphur content, mg/kg, max.		10	ISO 20847
vi.	Carbon residue (on 10 % distillation residue), % m/m, max.		0.3	ISO 10370
vii.	Cetane number, min.		51.0	ISO 5165
viii.	Distillation	Initial boiling point, °C	To be reported	ISO 3405
		% v/v, recovered at 250 °C, max.	65	
		% v/v, recovered at 350 °C, min.	85	
		95 % v/v, recovered at °C, max.	363	
		Final boiling point, °C, max.	400	
ix.	Water content, mg/kg, max.		200	ISO 12937
x.	Total contamination, mg/kg, max.		24	ASTM D6217

S/N	Property	Requirement	Test method
xi.	Copper strip corrosion (3 h at 50 ºC), rating, max.	Class 1	ISO 2160
xii.	Polycyclic aromatic hydrocarbons, % v/v, max.	11	EN 12916
xiii.	Oxidation stability, g/m^3, max.	25	ISO 12205
xiv.	Cold Filter Plugging Point (CFPP), °C, max.	12	ASTM D6371
xv.	Ash content, % m/m, max.	0.01	ISO 6245
xvi.	ASTM colour, max.	3.5	ISO 2049
xvii.	Lubricity, corrected wear scar diameter (wsd 1.4) at 60 ºC, µm, max.	460	ISO 12156-1
xviii.	Cloud point, ºC	To be reported	ISO 3015
xix.	Sediment, % m/m, max.	0.01	ISO 3735
xx.	Neutralization value: • Strong acid No., KOH, mg/g • Total acid No., KOH, mg/g	 Nil 0.5	ISO 6619
[a] For identification of biodiesel EN 14331 shall be used.			

5 Packaging, transportation and storage

5.1 The fuel shall be packaged, transported and stored in suitable containers, that are not detrimental to the quality of the fuel.

5.2 The containers shall be acceptably sealed, leak-proof, clean and free from materials soluble in automotive biodiesel B5 fuel.

6 Labelling

6.1 The following information shall be legibly and indelibly labelled on the container:

a) manufacturer’s/distributor's name and physical address;

b) name of the product as “Automotive biodiesel B5 fuel”;

c) batch number;

d) quantity;

e) safety symbols for toxicity and flammability;

f) warning, “DANGER”;

g) country of origin;

h) date of blending; and

i) blend ratio.

6.2 For bulk transportation the information given in 6.1 shall be in the documentation accompanying the product and the respective container shall be labelled with:

a) words “FLAMMABLE MATERIAL”; and

b) warning “DANGEROUS GOODS”.

6.3 Stickers shall be used in labelling in case of vehicles, which have compartments and transport more than one type of fuel.

6.4 Dispensing pumps used for delivering the fuel shall be clearly labelled with the wording “Automotive biodiesel B5 fuel” and the measurement dimensions of such shall be in accordance with relevant National Regulations.

7 Sampling

7.1 Sampling shall be done in accordance with ISO 3170 or ISO 3171.

7.2 In view of the sensitivity of certain test methods referenced in this standard, particular attention shall be given to the guidance on sampling containers specified in the relevant test methods.

8 Precision and dispute

8.1 All test methods referred to in this standard include a precision statement. In cases of dispute, the procedures for resolving the dispute and interpretation of the results based on test method precision, described in ISO 4259, shall be used.

8.2 In cases of dispute concerning density, ISO 3675 shall be used.

8.3 In cases of dispute concerning cetane number, ISO 5165 shall be used. For the determination of cetane number, alternative methods to those indicated in Table 1 shall be used, provided that these methods originate from a recognized method series, and have a valid precision statement, derived in accordance with ISO 4259, which demonstrates precision at least equal to that of the referenced method. The test result, when using an alternative method, shall also have a demonstrable relationship to the result obtained when using the referenced method.

Bibliography

KS 2953: 2023, *Petroleum and petroleum products — Automotive B5 biodiesel fuel — Specification*