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DRAFT EAST AFRICAN STANDARD

Automotive B5 biodiesel fuel — Specification

EAST AFRICAN COMMUNITY

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Copyright notice

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.*

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DRAFT EAST AFRICAN STANDARD **DEAS 1333: 2026**

Automotive B5 biodiesel fuel — Specification

1 Scope

This Draft East African Standard specifies requirements, test methods and sampling for automotive B5 biodiesel fuel. This standard is applicable to a fuel blend of 5% biodiesel and 95% automotive diesel.

2 Normative references

The following referenced documents 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 D86, *Standard test method for distillation of petroleum products and liquid fuels at atmospheric pressure*

ASTM D93, *Standard test methods for flash point by pensky-martens closed cup tester*

ASTM D95, *Standard test method for water in petroleum products and bituminous materials by distillation*

ASTM D130, *Standard test method for corrosiveness to copper from petroleum products by copper strip test*

ASTM D189, *Standard test method for conradson carbon residue of petroleum products*

ASTM D445, *Standard test method for kinematic viscosity of transparent and opaque liquids (and calculation of dynamic viscosity)*

ASTM D473, *Standard test method for sediment in crude oils and fuel oils by the extraction method*

ASTM D482, *Standard test method for ash from petroleum products*

ASTM D613, *Standard test method for cetane number of diesel fuel oil*

ASTM D664, *Standard test method for acid number of petroleum products by potentiometric titration*

ASTM D974, *Standard test method for acid and base number by color-indicator titration*

ASTM D976, *Standard test method for calculated cetane index of distillate fuels*

ASTM D1298, *Standard test method for density, relative density, or api gravity of crude petroleum and liquid petroleum products by hydrometer method*

ASTM D1500, *Standard test method for astm colour of petroleum products (ASTM colour scale)*

ASTM D1552, *Standard test method for sulfur in petroleum products by high temperature combustion and Infrared (IR) detection or Thermal Conductivity Detection (TCD)*

ASTM D2274, *Standard test method for oxidation stability of distillate fuel oil (accelerated method)*

ASTM D2500, *Standard test method for cloud point of petroleum products and liquid fuels*

ASTM D4052, *Standard test method for density, relative density, and api gravity of liquids by digital density meter*

ASTM D4294, *Standard test method for sulfur in petroleum and petroleum products by energy*

dispersive X- ray fluorescence spectrometry

ASTM D4530, *Standard test method for determination of carbon residue (micro method)*

ASTM D4737, *Standard test method for calculated cetane index by four variable equation*

ASTM D5453, *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 D5771, *Standard test method for cloud point of petroleum products and liquid fuels (optical detection stepped cooling method)*

ASTM D5773, *Standard test method for cloud point of petroleum products and liquid fuels (constant cooling rate method)*

ASTM D6078, *Standard test method for evaluating lubricity of diesel fuels by the Scuffing Load Ball-on-Cylinder Lubricity Evaluator (SLBOCLE)*

ASTM D6079, *Standard test method for evaluating lubricity of diesel fuels by the High-Frequency Reciprocating Rig (HFRR)*

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

ASTM D6304, *Standard test method for determination of water in petroleum products, lubricating oils and additives by coulometric Karl Fischer titration*

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

ASTM D7042, *Standard test method for dynamic viscosity and density of liquids by stabinger viscometer and the calculation of kinematic viscosity*

ASTM D7321, *Standard test method for particulate contamination of biodiesel B100 blend stock biodiesel esters and biodiesel blends by laboratory filtration*

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)*

ASTM D7861, *Standard test method for determination of Fatty Acid Methyl Esters (FAME) in diesel fuel by Linear Variable Filter (LVF) array based mid-infrared spectroscopy*

EN 116, *Diesel and domestic heating fuels — Determination of cold filter plugging point — Stepwise cooling bath method*

EN 12662, *Liquid petroleum products — Determination of contamination in middle distillates*

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

EN 14078, *Liquid petroleum products — Determination of Fatty Acid Methyl Esters (FAME) in middle distillates Infrared spectroscopy method*

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

IP 4, *Petroleum products — Determination of ash*

IP 13, *Petroleum products — Determination of carbon residue — Conradson method*

IP 34, *Determination of flash point — Pensky-martens closed cup method*

IP 53, *Crude petroleum and fuel oils — Determination of sediment — Extraction method*

IP 71, *Petroleum products — Transparent and opaque liquids — Determination of kinematic viscosity and calculation of dynamic viscosity*

IP 74, *Petroleum products and bituminous materials — Determination of water — Distillation method*

IP 123, *Petroleum products — Determination of distillation characteristics at atmospheric pressure*

IP 154, *Petroleum products — Corrosiveness to copper — Copper strip test*

IP 160, *Crude petroleum and liquid petroleum products — Laboratory determination of density — Hydrometer method*

IP 219, *Petroleum products — Determination of cloud point*

IP 309, *Diesel and domestic heating fuels — Determination of cold filter plugging point copy diesel fuel oil using mid infrared spectroscopy (FTIR-ATR-PLS method)*

IP 365, *Crude petroleum and petroleum products — Determination of density — Oscillating U-tube method and Infrared (IR) detection or Thermal Conductivity Detection (TCD) engine fuel, diesel engine fuel, and engine oil by ultraviolet fluorescence*

IP 380, *Petroleum products — Calculation of cetane index of middle distillate fuels by the four-variable equation*

IP 388, *Petroleum products — Determination of the oxidation stability of middle-distillate fuels*

IP 393, *Determination of volatility of automotive lubricating oils — Thermogravimetric method*

IP 398, *Petroleum products — Determination of carbon residue — Micro method*

IP 440, *Liquid petroleum products — Determination of contamination in middle distillates*

IP 450, *Diesel fuel – Assessment of lubricity using the high-frequency reciprocating rig (HFRR) – Part 1: Test 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, *Petroleum liquids — Manual sampling*

ISO 3171, *Petroleum liquids — Automatic pipeline sampling*

ISO 3405, *Petroleum products — Determination of oscillation characteristics at atmospheric pressure*

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

ISO 3733, *Petroleum products and bituminous materials — Determination of water — Distillation method*

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

ISO 4259, *Petroleum products — Determination and application of precision data in relation to*

methods of test

ISO 4264, *Petroleum products — Calculation of Cetane index of middle-distillate fuels by the four-variable equation*

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

ISO 6245, *Petroleum products — Determination of ash*

ISO 6296, *Petroleum products — Determination of water — Potentiometric Karl fischer titration method*

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

ISO 7537, *Petroleum products — Determination of acid number — Semi-micro colour-indicator titration method*

ISO 8754, *Petroleum products — Determination of sulfur content — Energy-dispersive X-ray fluorescence spectrometry*

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 12185, *Crude petroleum and petroleum products- Determination of density — Oscillating U-tube 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 14596, *Petroleum products — Determination of sulfur content — Wavelength-dispersive X-ray fluorescence spectrometry*

ISO 20846, *Petroleum products — Determination of sulfur content of automotive fuels — Ultraviolet fluorescence method*

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

ISO 20884, *Petroleum products — Determination of sulfur content of automotive fuels — Wavelength-dispersive X-ray fluorescence spectrometry*

DEAS XXXX: 2026, *Automotive biodiesel fuel - Specification*

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:

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

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

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

3.4
dyes
chemicals added to fuels for visual identification

3.5
markers
substances 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 of 5% biodiesel and 95% automotive diesel. The 5% biodiesel shall comply with DEAS 1332: 2026 *Automotive biodiesel fuel - Specification*, and 95% of automotive diesel shall comply with EAS 177. Suitable additives may be added to enhance storage and performance properties of the fuel.

4.1.2 The automotive biodiesel fuel shall contain, principally, mono-alkyl methyl esters of long chain fatty acids derived from vegetable oil, waste streams either from animal fats, used cooking oil or fish oils.

4.1.3 The fuel may contain small quantities of dye, which are documented as harmless to give it 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 all the requirements given in Table 1 when tested in accordance with the test methods specified therein.

NOTE In case of a need for identification of biodiesel, it is recommended that a method based on the characterization of fatty acid methyl esters (FAME) by Liquid Chromatograph (LG)/ Gas Chromatography (GC), in accordance with EN 14331, be used.

Table 1 — Requirements for automotive B5 biodiesel fuel

S/No.	Property		Requirement	Test method
i.	FAME content, % volume fraction, max.		5	EN 14078 ASTM D7371 ASTM D7861
ii.	Density at 15 ºC, kg/m^3		820 – 870	ISO 3675 ISO 12185 ASTM D1298 ASTM D4052 IP 160 IP 365 ASTM D7042
iii.	Density at 20 ºC, kg/m^3		820 – 850	
iv.	Kinematic viscosity at 40 ºC, mm^2/s		2.0 – 5.0	ISO 3104 ASTM D445 IP 71
v.	Flash point, ºC, min.		60	ISO 2719 ASTM D93 IP 34
vi.	Sulphur content, mg/kg, max.		10	ISO 14596 ISO 8754 ISO 20846 ISO 20884 ISO 20847 ASTM D1552 ASTM D4294 ASTM D5453
vii.	Carbon residue (on 10 % distillation residue), %, mass fraction, max.		0.15	ISO 10370 ASTM D4530 ASTM D189 IP 13 IP 398
viii.	Cetane Number, min.		51.0	ISO 5165 ASTM D613
ix.	Distillation temperature (% v recovered)	Initial boiling point	To be reported	ISO 3405 ASTM D86 IP 123
		% (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	

S/N	Property	Requirement	Test method
x.	Water content, mg/kg, max.	200	ISO 12937 IP 74 ISO 3733 ASTM D6304 ASTM D95 ISO 6296
xi.	Total contamination, mg/kg, max.	24	EN 12662 ASTM D6217 IP 440 ASTM D7321
xii.	Copper strip corrosion (3 h at 50 °C), rating, max.	Class 1	ISO 2160 ASTM D130 IP 154
xiii.	Polycyclic aromatic hydrocarbons, % (v/v), max.	11	EN 12916 IP 393
xiv.	Oxidation stability, g/m^3, max.	25	ISO 12205 ASTM D2274 IP 388
xv.	Cold Filter Plugging Point (CFPP), max.	12	IP 309 ASTM D6371 EN 116
xvi.	Ash content, %, (m/m), max.	0.01	ISO 6245 ASTM D482 IP 4
xvii.	ASTM colour, max.	3.5	ISO 2049 ASTM D1500
xviii.	Lubricity, corrected wear scar diameter (wsd 1.4) at 60 °C, µm, max.	450	ISO 12156-1 ASTM D6078 ASTM D6079 IP 450
xix.	Cloud Point, °C	To be reported	ISO 3015 ASTM D2500 ASTM D5771 ASTM D5773 IP 219
xx.	Sediment, % m/m, max.	0.01	ISO 3735 ASTM D473 IP 53
xxi.	Neutralization value: • Strong acid No., KOH, mg/g • Total acid No., KOH, mg/g	Nil 0.5	ISO 6619 ASTM D974 ISO 7537 ASTM D664

4.3 Dyes and markers

The use of dyes and markers is allowed.

5 Packing, Transportation and Storage

Biodiesel shall be transported and stored in suitable containers, not deleteriously affected by the biodiesel. The containers shall be securely sealed to prevent leakage and contamination of the fuel during storage and transportation

6 Labelling

6.1 The following information shall be prominently, legibly and indelibly marked on each drum or, in the case of biodiesel filled in bulk storage tanks or bulk carriers, in the storage and consignment documents of each bulk carrier:

a) the manufacturer's (or the supplier's) name or/and physical address, the brand name of the product or both;
b) product name as "Automotive B5 biodiesel fuel";
c) batch identification; and
d) the quantity of the contents.
e) the warning, "DANGER"
f) date of blending;
g) country of origin

6.2 For bulk transportation, the information specified in 6.1 shall be in the documentation accompanying the product.

7 Sampling

7.1 Samples shall be taken in accordance with ISO 3170 or ISO 3171.

7.2 In view of the sensitivity of some of the test methods referred to in this standard, particular attention shall be paid to compliance with any guidance on sampling containers, which is included in the test method standard.

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, 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*