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EAST AFRICAN STANDARD

Automotive gas oil (automotive diesel) — 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 East Africa. It is envisaged that through harmonized standardization, trade barriers which are encountered when goods and services are exchanged within the Community will be removed.

In order to meet the above objectives, the EAC Partner States have enacted an East African Standardization, Quality Assurance, Metrology and Test Act, 2006 (EAC SQMT Act, 2006) to make provisions for ensuring standardization, quality assurance, metrology and testing of products produced or originating in a third country and traded in the Community in order to facilitate industrial development and trade as well as helping to protect the health and safety of society and the environment in the Community.

East African Standards are formulated in accordance with the procedures established by the East African Standards Committee. The East African Standards Committee is established under the provisions of Article 4 of the EAC SQMT Act, 2006. The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the private sectors and consumer organizations. 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 procedures of the Community.

Article 15(1) of the EAC SQMT Act, 2006 provides that "Within six months of the declaration of an East African Standard, the Partner States shall adopt, without deviation from the approved text of the standard, the East African Standard as a national standard and withdraw any existing national standard with similar scope and purpose".

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.

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Automotive gas oil (automotive diesel) — Specification

1 Scope

This East African Standard specifies the requirements and methods of test for automotive gas oil (automotive diesel).

This standard applies to diesel, used for automotive diesel engines, as manufactured, stored, transported and marketed.

2 Normative references

The following referenced documents are indispensable for the application 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 D2500 [IP 309], *Standard test method for cloud point of petroleum products*

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 14274 [IP 508], *Methods of test for petroleum and its products — Automotive fuels — Assessment of petrol and diesel quality — Fuel quality monitoring system (FQMS)*

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

ISO 3405, *Petroleum products — Determination of distillation 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 — Distillate fuels — Calculation of cetane index*

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

ISO 6245, *Petroleum products — Determination of ash*

ISO 6615, *Petroleum products — Determination of carbon residue — Conradson 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 10370, *Petroleum products — Determination of carbon residue (micro method)*

ISO 12156-1, *Diesel fuels — Assessment of lubricity by HFRR*

ISO 12185, *Crude petroleum and petroleum products — Determination of density — Oscillating U-tube method*

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

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

ISO 13759, *Petroleum products — Determination of alkyl nitrate in diesel fuels — Spectrometric method*

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*

ISO 3015, *Petroleum products — Determination of cloud point*

ISO 17020, *General criteria for the operation of various types of bodies performing inspection*

3 Definitions

For the purpose of this standard the following definitions apply.

3.1
automotive gas oil
this is fuel that is used in high-speed diesel engines

3.2
additives
material added to AGO usually in small amounts, to impart or enhance desirable properties or to suppress undesirable properties

3.3
dyes
dyes are chemicals added to fuel for visual identification

3.4
markers
markers are substances added to petroleum based products for traceability to protect them against theft or adulteration and also to distinguish between different fuels

4 Requirements

4.1 Dyes and markers

The use of dyes or markers is allowed.

Table 1 — generally applicable requirements and test methods

Property	Unit	Limits		Test method [a] (see Normative references)
		Minimum	Maximum	
Appearance		Clear and bright and free from suspended particles		visual
Cetane number [b]		51.0	—	ISO 5165
Cetane index		48.0	—	ISO 4264 ASTM D 976
Density at 15 °C [c]	kg/m^3	820	870	ISO 3675 ISO 12185
Density at 20 °C		817	867	ASTM D 1298 IP 160
ASTM colour		—	3.5	ISO 2049 ASTM D 1500
Polycyclic aromatic hydrocarbons [d], [e]	% (v/v)	—	11	EN 12916
Sulfur content [f]	mg/kg	—	500.0(until 31.12.2014)	ISO 20846; ISO 20847
			50.0	ISO 20884 ASTM D 1552
Flash point	°C	66	—	ISO 2719 ASTM D 93 IP 34
Carbon residue [g] (on 10 % distillation residue)	% (m/m)	—	0.15	ISO 10370 ISO 6615 ASTM D 189; IP 13
Ash content	% (m/m)	—	0.01	ISO 6245 ASTM D 482
Water content	mg/kg	—	200	ISO 12937 ASTM D 95 IP 74/82
Copper strip corrosion (3 h at 50 °C)	rating	Class 1		ISO 2160 ASTM D 130 IP 154
Oxidation stability	g/m^3	—	25	ISO 12205
Lubricity, corrected wear scar diameter (wsd 1.4) at 60 °C	µm	—	450	ISO 12156-1 ASTM D 6078
Viscosity at 40 °C	mm^2/s	2.0	5.3	ISO 3104 ASTM D 445 IP 71
Cloud point	°C,	To be reported		ISO 3015 ASTM D2500
Cold filter plugging point (CFPP)	°C,	—	12	[IP 309]
Sediment	% m/m	—	0.01	ISO 3735 ASTM D 473 IP 53
Neutralization value: Strong acid No., KOH Total acid No., KOH	 mg/g mg/g	 Nil	 0.5	ISO 6619 ASTM D 974
Distillation [h] Initial boiling point % (V/V) recovered at 250 °C % (V/V) recovered at 350 °C % (V/V) recovered at 365 °C 95 % (V/V) recovered at Final boiling point	 °C % (V/V) % (V/V) % (V/V) °C °C	 To be reported 65 85 90 360 400		ISO 3405 ASTM D 86 IP 123

NOTE For the purpose of this standard, the sulfur content shall be 500mg/kg, max, until 31.12.2014 and thereafter 50 mg/kg, max.

[a] See also 4.5.1

[b] See also 4.5.4

[c] See also 4.5.2

[d] For the purposes of this East African Standard, polycyclic aromatic hydrocarbons are defined as the total aromatic hydrocarbon content less the mono-aromatic hydrocarbon content, both as determined by EN 12916.

[ef] See also 4.5.3

[g] See also 4.5.2

[h] For the calculation of the cetane index the 10 %, 50 % and 90 % (V/V) recovery points are also needed.

4.2 Additives

In order to improve the performance quality, the use of additives is allowed. Suitable fuel additives without known harmful side-effects are recommended in the appropriate amount, to help to avoid deterioration of drivability and emissions control durability.

4.3 Generally applicable requirements and related test methods

When tested by the methods indicated in Table 1, automotive diesel fuel shall be in accordance with the limits specified in Table 1.

4.4 Precision and dispute

4.4.1 All test methods referred to in this East African 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.

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

4.4.3 In cases of dispute concerning sulfur content, ISO 20847 is unsuitable as an arbitration method.

4.4.4 For the determination of cetane number alternative methods may also be used in cases of dispute, 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

SANS 342:2006, *Automotive diesel fuel*

BS EN 590:2004, *Automotive fuels — Diesel — Requirements and test methods*