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EAST AFRICAN STANDARD

Automotive gasoline (premium motor spirit) — Specification

EAST AFRICAN COMMUNITY

HS 2710.11.10(regular); HS 2710.11.10(premium)

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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 gasoline (premium motor spirit) — Specification

1 Scope

This East African Standard specifies requirements and methods of test for automotive gasoline, Premium Motor Spirit, PMS.

This standard applies to automotive gasoline, premium motor spirit, also commonly known as petrol, for use in spark ignition engines, including those equipped with devices to reduce emitted pollutants. The standard applies to PMS 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.

EN 237, *Liquid petroleum products — Petrol — Determination of low lead concentrations by atomic absorption spectrometry*

EN 238, *Liquid petroleum products — Petrol — Determination of the benzene content by infrared spectrometry*

EN 1601, *Liquid petroleum products — Unleaded petrol — Determination of organic oxygenate compounds and total oxygen content by gas chromatography (O-FID)*

EN 12177, *Liquid petroleum products — Unleaded Petrol — Determination of benzene content by gas chromatography*

EN 13016-1, *Liquid petroleum products — Vapour pressure — Part 1: Determination of air saturated vapour pressure (ASVP)*

EN 13132, *Liquid petroleum products — Unleaded petrol — Determination of organic oxygenate compounds and total organically bound oxygen content by gas chromatography using column switching*

EN 14517, *Liquid petroleum products — Determination of hydrocarbon types and oxygenates in petrol — Multidimensional gas chromatography method*

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

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

ISO 5163, *Petroleum products — Determination of knock characteristics of motor and aviation fuels — Motor method*

ISO 5164, *Petroleum products — Determination of knock characteristics of motor fuels — Research method*

ISO 6246, *Petroleum products — Gum content of light and middle distillate fuels — Jet evaporation method*

ISO 7536, *Gasoline — Determination of oxidation stability of gasoline — Induction period method*

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

ASTM D 1613, *Standard test method for acidity in volatile solvents and chemical intermediates used in paint, varnish, lacquer, and related products*

ASTM D 323, Standard test method for vapour pressure of petroleum products (Reid Method)

ISO 1998, *Petroleum industry — Terminology* (all parts)

ASTM D4953, *Standard test method for vapor pressure of gasoline and gasoline-oxygenate blends (dry method)*

ASTM D86, *Standard test method for distillation of petroleum products at atmospheric pressure*

3 Definitions

In addition to the terms and definitions given in ISO 1998, the following definitions apply to this East African Standard.

3.1
Additive
Material added to PMS, usually in small amounts, to impart or enhance desirable properties or to suppress undesirable properties

3.2
Marketable
Acceptable smell for safe handling

3.3
Marker
Markers are substances added to petroleum based products for traceability to protect them against theft or adulteration and also to distinguish between different fuels.

3.4
dye
dyes are chemicals added to fuel for visual identification

4 Pump marking

Information to be marked on dispensing pumps used for delivering PMS, and the dimensions of the mark shall be in accordance with the requirements of the relevant weights and measures regulations for each member state for the marking of pumps for unleaded petrol.

5 Requirements and test methods

5.1 Dyes and markers

The use of dyes and markers is allowed.

The dye content shall be reported and shall not alter any parameters of PMS out of the specified ranges as indicated under Table 1

Table 1 — generally applicable requirements and test methods for premium motor spirit

Property	Requirement		Method of test
	Min.	Max	
Research octane number, RON	91 **(until 31.12.2014)**	—	ISO 5164
	93	—	ASTM D2699
Motor octane number, MON	81 **(until 31.12.2014)**	—	ISO 5163
	83	—	ASTM D2700
Lead content, mg/L	—	13.0	EN 237 ASTM D3237/IP 428
Benzene content, % v/v	—	3.0	EN 238/IP429 ASTM D4420
Total aromatics, % v/v	To be reported		ASTM D1319, ASTM D5580 or ASTM D5443
Density (at 20 ºC), kg/m^3	716	771	ISO 3675
Density (at 15 ºC), kg/m^3	720	780	ASTM D4052 ASTM D1298
Sulphur content, % m/m	—	0.015	EN 24260 ISO 8754 ASTM D2622/IP 336
Oxidation stability, minutes	360	—	ISO 7536/IP 40 ASTM D525
Existent gum content (solvent washed), mg/100 ml	—	5	ISO 6246 ASTM D381
Copper strip corrosion (3 h at 50 °C), rating	—	No.1 strip	ISO 2160/IP 154 ASTM D130
Appearance	Clear and bright and free from suspended particles		Visual inspection
Doctor test [a]	To be reported		ASTM D4952/IP30
Mercaptan sulphur, % m/m	0.001		ASTM D3227
Colour	Red		Visual inspection
Dye content, mg/m^3	1.3		—
Odour	Marketable		—
Oxygenates	NIL		EN 1601 EN 13132
RVP at 37.8 ºC, KPa	65		—
FVI (see Clause 5.4)	93		ASTM D323
Distillation			ASTM D86, or IP 123
a) Temperature, °C for:	To be reported		
Initial boiling point			ASTM D86
10 % volume fraction evaporated, max	71		
50 % volume fraction evaporated, max	77-115		
90 % volume fraction evaporated, max	180		
b) Final boiling point, °C, max.	210		
c) Residue, % volume fraction, max	2.0		
d) Evaporated to 70 °C (E70), % volume fraction	To be reported		

[a] If negative, no need to carry out Mercaptan sulphur test.

NOTE For the purpose of this standard, the RON and MON shall be 91 and 81, Min, respectively until 31.12.2014 and thereafter 93 and 83 Min respectively. For the case of Tanzania, however, RON and MON of 93 and 83, Min, respectively shall apply immediately

5.2 Additives

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

5.3 Generally applicable requirements and test methods

When tested in accordance with the test methods indicated in Table 1, automotive gasoline premium motor spirit shall be in accordance with the limits specified in Table 1.

5.4 Flexible volatility index

The flexible volatility index (FVI) is an additional parameter which characterizes the volatility properties of petrol, and is calculated using the formula

$$FVI = RVP + 0.7\ E70$$

where

RVP is the Reid vapour pressure, in kilopascals;

E70 is the percentage volume fraction of petrol, evaporated to 70 °C.

6 Precision and dispute

6.1 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, ASTM D 3244, IP 377, shall be used.

6.2 In cases of dispute

- concerning sulphur, ISO 20847 is unsuitable as an arbitration method
- concerning benzene content, EN 12177 shall be used.
- concerning oxygen and oxygenates content, EN 1601 shall be used.
- concerning density, ISO 3675 shall be used.

Bibliography

SANS 1598:2006, *Unleaded petrol*

BS EN 228:2004, *Automotive fuels — Unleaded petrol — Requirements and test methods*