

**MAURITIAN
STANDARD**

**MS EN 228:2012
+ A1:2017**

First edition
2019-02-23

Automotive fuels – Unleaded petrol – Requirements and test methods

ICS: 75.160.20



**Mauritius Standards Bureau
Moka**

This national standard is the identical implementation of EN 228:2012+A1:2017 and is adopted with the permission of CEN, Avenue Marnix 17, B-1000 Brussels, Belgium.

National foreword

This Mauritian Standard is identical with the European Standard **EN 228:2012+A1:2017**, *Automotive fuels – Unleaded petrol -- Requirements and test methods*. It has been adopted as a national standard upon the recommendation of the **Mechanical Engineering Standards Committee** through its **Subcommittee on Ethanol/Fuel Blend**. It was approved by the **Standards Council** on **29 October 2018** and was notified in the **Government Gazette** on **23 February 2019***.

For the purpose of this standard the following changes should be made:

- (i) the words 'European Standard' should be replaced by 'Mauritian Standard'
- (ii) the 'decimal comma' should be replaced by 'decimal point'.

* General Notice No **257** of **2019**



COPYRIGHT PROTECTED DOCUMENT

© MSB 2019

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission from Mauritius Standards Bureau at the address below

*Mauritius Standards Bureau
Villa Road
Moka
Mauritius*

*Telephone + (230) 433 3648
Fax + (230) 433 5051/ 433 5150*

*E-mail msb@intnet.mu
Website <http://msb.intnet.mu>*

English Version

Automotive fuels - Unleaded petrol - Requirements and test methods

Carburants pour automobiles - Essence sans plomb -
Exigences et méthodes d'essai

Kraftstoffe für Kraftfahrzeuge - Unverbleite
Ottokraftstoffe - Anforderungen und Prüfverfahren

This European Standard was approved by CEN on 1 September 2012 and includes Amendment 1 approved by CEN on 17 March 2017.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents	Page
European foreword.....	3
1 Scope	5
2 Normative references	5
3 Sampling	7
4 Pump marking	7
5 Requirements and test methods	7
5.1 ☐ Bio-components ☐	7
5.2 Dyes and markers	8
5.3 Additives	8
5.4 Generally applicable requirements and test methods	8
5.5 Climatically dependent requirements and test methods	11
5.6 Octane reporting	15
5.7 Precision and dispute	15
Annex A (normative) Vapour pressure waiver	17
A.1 Vapour pressure waiver permitted	17
A.2 Guidance for checking compliance with the permitted waiver	17
Bibliography	19

European foreword

This document (EN 228:2012+A1:2017) has been prepared by Technical Committee CEN/TC 19 “Gaseous and liquid fuels, lubricants and related products of petroleum, synthetic and biological origin”, the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2017, and conflicting national standards shall be withdrawn at the latest by November 2017.

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

This document supersedes A1 EN 228:2012 A1.

This document includes Amendment 1 approved by CEN on 17 March 2017.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

This document was originally prepared under a mandate given to CEN by the European Commission and the European Free Trade Association. In addition to other standards, it is intended to be complementary to the regulatory measures contained in various EU Directives.

The following is a list of significant technical changes between this European Standard and the previous edition:

- A1 New requirements following amendment 2009/30/EC [3], 2011/63/EU [4] and 2014/77/EU [11] to the European Fuels Quality Directive 98/70/EC [1], are taken into account. A1 Tables 1, 2, 3, 4 and A.1 explicitly differentiate between requirements included in the European Fuels Directive 98/70/EC [1], including subsequent Amendments [2], [3] and [4], and other requirements.
- Specific requirements concerning the limitation of use of methylcyclopentadienyl manganese tricarbonyl (MMT) as required by the EC have been incorporated.
- As the introduction of 10 % (V/V) of ethanol in unleaded petrol has an impact on refinery and blending processes, an update of the distillation characteristics has been considered and a new Table 3 with slightly adapted volatility classes (E70, E100 and VLI) has been introduced. Work is still ongoing to generate data that would support the idea that these changes do not affect cold starting and hot weather driveability aspects of the vehicles. These updates have been agreed upon with precaution and might be revised depending on fuel-related issues in the market.
- Further specification is given, by including separate tables on unleaded petrol grade for older vehicles that are not warranted to use unleaded petrol with a high biofuel content. A CEN/TR aiming at giving guidance on oxygenate blending has been prepared in parallel [5].
- Further clarification on how to determine the vapour pressure waiver for unleaded petrol containing ethanol, allowed on the market under exemption circumstances, is given in Annex A. The exact number of decimal points for the waiver has been clarified [4].
- Several new or revised test methods have been introduced. The European Fuels Directive 98/70/EC [1], including its Amendments [2] [3] [4], A1 [11] A1 refers to test methods in

EN 228:2004, with the requirement that updated analytical methods shall be shown to give at least the same accuracy and at least the same precision as the methods they replace.

- Removal of the allowance for 50 mg/kg sulfur content.
- Reference to the revised ethanol specification EN 15376.

A1) The marking at the pump of this product is in line with the requirements of the Fuels Quality Directive and the Alternative Fuels Infrastructure Directive [12]. **A1**

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

PREVIEW

1 Scope

This European Standard specifies requirements and test methods for marketed and delivered unleaded petrol. It is applicable to unleaded petrol for use in petrol engine vehicles designed to run on unleaded petrol.

This European Standard specifies two types of unleaded petrol: one type with a maximum oxygen content of 3,7 % (m/m) and a maximum ethanol content of 10,0 % (V/V) in Table 1, and one type intended for older vehicles that are not warranted to use unleaded petrol with a high biofuel content, with a maximum oxygen content of 2,7 % (m/m) and a maximum ethanol content of 5,0 % (V/V) in Table 2.

NOTE 1 The two types are based on European Directive requirements [3], [4], ^[A1] [11] ^[A1].

NOTE 2 For the purposes of this European Standard, the terms “% (m/m)” and “% (V/V)” are used to represent respectively the mass fraction, μ , and the volume fraction, φ .

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 237:2004, *Liquid petroleum products — Petrol — Determination of low lead concentrations by atomic absorption spectrometry*

EN 238:1996/A1:2003, *Liquid petroleum products — Petrol — Determination of the benzene content by infrared spectrometry*

^[A1] EN 1601:2014¹, *Liquid petroleum products — Unleaded petrol — Determination of organic oxygenate compounds and total organically bound oxygen content by gas chromatography (O-FID)* ^[A1]

EN 12177:1998, *Liquid petroleum products — Unleaded petrol — Determination of benzene content by gas chromatography*

^[A1] EN 13016-1:2007¹, *Liquid petroleum products — Vapour pressure — Part 1: Determination of air saturated vapour pressure (ASVP) and calculated dry vapour pressure equivalent (DVPE)* ^[A1]

EN 13132:2000, *Liquid petroleum products — Unleaded petrol - Determination of organic oxygenate compounds and total organically bound oxygen content by gas chromatography using column switching*

^[A1] EN 14275:2013, *Automotive fuels — Assessment of petrol and diesel fuel quality — Sampling from retail site pumps and commercial site fuel dispensers* ^[A1]

^[A1] EN 15376:2014, *Automotive fuels — Ethanol as a blending component for petrol — Requirements and test methods* ^[A1]

EN 15553:2007, *Petroleum products and related materials — Determination of hydrocarbon types - Fluorescent indicator adsorption method*

¹ Under revision.