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BSI Standards Publication

## Automotive fuels - LPG - Requirements and test methods

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## National foreword

This British Standard is the UK implementation of EN 589:2018. It supersedes BS EN 589:2008+A1:2012, which is withdrawn.

BSI, as a member of CEN, is obliged to publish EN 589:2018 as a British Standard. However, attention is drawn to the fact that during the development of this European Standard, the UK committee voted against its approval.

The UK committee voted negatively as EN 589:2018 references ASTM D6667-14 for the testing of total volatile sulphur in LPG. The UK committee does not consider ASTM D6667-14 to support the new proposed limit of 30 mg/kg outlined in EN 589:2018.

The UK participation in its preparation was entrusted to Technical Committee PTI/15, Natural Gas and Gas Analysis.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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**Compliance with a British Standard cannot confer immunity from legal obligations.**

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 December 2018.

### Amendments/corrigenda issued since publication

Date	Text affected
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## EUROPÄISCHE NORM

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English Version

**Automotive fuels - LPG - Requirements and test methods**Carburants pour automobiles - GPL - Exigences et  
méthodes d'essaiKraftstoffe - Flüssiggas - Anforderungen und  
Prüfverfahren

This European Standard was approved by CEN on 19 October 2018.

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: Rue de la Science 23, B-1040 Brussels**

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## European foreword

This document (EN 589:2018) 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 June 2019, and conflicting national standards shall be withdrawn at the latest by June 2019.

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

This document supersedes EN 589:2008+A1:2012.

This is the 7<sup>th</sup> edition of EN 589. The main technical changes include:

- a) reduction of the sulfur limit value to 30 mg/kg;
- b) removal of ASTM D 3246, sulfur determination by oxidative microcoulometry, as being incapable of measuring that level;
- c) addition of single limit value for propane in Table 1;
- d) addition of a single limit value for 1,3 butadiene in Table 1 due to CLP requirements [5];
- e) introduction of a test method for the determination of 1,3 butadiene and hydrocarbon composition, for the determination of low sulfur levels in LPG (prEN 17178) and to determine evaporation residue (EN 16423);
- f) addition of Clause 7 "Remarks concerning vehicle application issues like residues in vaporizers or injectors";
- g) permission to use alternative odour tests added to sub-clause 6.3. The odour test according to Annex A is not a precise test method with any given precision. Odour is subjectively perceived, not measured. For this reason it is hard to define a referee method;
- h) inclusion of reference to EN 16942 regarding pump marking in line with the requirements set by the new Directive 2014/94/EU [1].

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.

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## 1 Scope

This document specifies requirements and test methods for marketed and delivered automotive liquefied petroleum gas (LPG), with LPG defined as low pressure liquefied gas composed of one or more light hydrocarbons which are assigned to UN 1011, 1075, 1965, 1969 or 1978 only and which consists mainly of propane, propene, butane, butane isomers, butenes with traces of other hydrocarbon gases.

This standard is applicable to automotive LPG for use in LPG engine vehicles designed to run on automotive LPG.

NOTE For the purposes of this European Standard, the terms "% (m/m)" and "% (V/V)" are used to represent respectively the mass fraction,  $\mu$ , and the volume fraction,  $\varphi$ .

**WARNING — Attention is drawn to the risk of fire and explosion when handling LPG and to the hazard to health arising through inhalation of excessive amounts of LPG.**

**LPG is a highly volatile hydrocarbon liquid which is normally stored under pressure. If the pressure is released large volumes of gas will be produced which form flammable mixtures with air over the range of approximately 2 % (V/V) to 10 % (V/V). This European Standard involves the sampling, handling and testing of LPG. Naked flames, unprotected electrical equipment electrostatic hazards etc. are sources of ignition for LPG.**

**LPG in liquid form can cause cold burns to the skin. The national health and safety regulations apply.**

**LPG is heavier than air and accumulates in cavities. There is a danger of suffocation when inhaling high concentrations of LPG.**

**CAUTION —** One of the tests described in this European Standard involves the operator inhaling a mixture of air and LPG vapour. Particular attention is drawn to the cautionary statement provided in A.1, where this method is referred to.

## 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.

EN 15469, *Petroleum products - Test method for free water in liquefied petroleum gas by visual inspection*

EN 15470, *Liquefied petroleum gases - Determination of dissolved residues - High temperature Gas chromatographic method*

EN 15471, *Liquefied petroleum gases - Determination of dissolved residues - High-temperature gravimetric method*

EN 16423, *Liquefied petroleum gases - Determination of dissolved residue - Gas chromatographic method using liquid, on-column injection*

EN 16942, *Fuels - Identification of vehicle compatibility - Graphical expression for consumer information*

prEN 17178:2017, *Automotive fuels — Sulfur content in liquefied petroleum gas — Determination by ultraviolet fluorescence (UVF)*

EN 27941, *Commercial propane and butane - Analysis by gas chromatography (ISO 7941)*

EN ISO 4256, *Liquefied petroleum gases - Determination of gauge pressure - LPG method (ISO 4256)*