

Automotive fuels — LPG — Requirements and test methods

The European Standard EN 589:2004 has the status of a
British Standard

ICS 75.160.30

National foreword

This British Standard is the UK implementation of EN589:2004, incorporating corrigenda September 2004 and December 2005. It supersedes BS EN 589:2000 which is withdrawn.

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.

The principal differences between this edition of BS EN 589 and the 2000 edition are given in the European Standard foreword.

EN 589 requires that each country implementing it establishes national annexes detailing requirements for sampling and pump marking, as well as climate-dependent requirements. These requirements are given in National annex NA, National annex NB and National annex NC respectively.

WARNING. Attention is drawn to the warning given in Annex A. Attention is also drawn to the guidance notes associated with the Control of Substances Hazardous to Health Regulations 2002, such as the current version of Guidance Note EH 40, *Occupational exposure limits*, published by the Health and Safety Executive.

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

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

Amendments issued since publication

Amd. No.	Date	Comments
15384 Corrigendum No. 1	28 September 2004	Replacement of National annexes NA, NB and NC
17167 Corrigendum No. 2	29 June 2007	Correction to Table B.1

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 14 September 2004

© BSI 2007

ISBN 978 0 580 59204 1

English version

Automotive fuels - LPG - Requirements and test methods

Carburant pour automobiles - GPL - Exigences et
méthodes d'essai

Kraftstoffe für Kraftfahrzeuge - Flüssiggas - Anforderungen
und Prüfverfahren

This European Standard was approved by CEN on 24 December 2003.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

Foreword	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	5
4 Sampling.....	5
5 Pump marking.....	5
6 Requirements and test methods.....	5
6.1 General.....	5
6.2 Water content.....	6
6.3 Odour	7
6.4 Density	7
6.5 Precision and dispute	7
Annex A (normative) Test method for odour of LPG	8
A.1 Introduction.....	8
A.2 Principle.....	8
A.3 Material	8
A.4 Apparatus	8
A.5 Procedure	9
A.6 Expression of results	9
Annex B (normative) Method of calculation of the Motor Octane Number (MON) from compositional analysis of LPG	10
B.1 Introduction.....	10
B.2 Principle.....	10
B.3 Determination.....	10
B.4 Calculation and expression of results.....	10
B.5 Reporting.....	10
Annex C (normative) Absolute vapour pressure blending factors (kPa)	12
Annex D (informative) Seasonal gauge vapour pressure limits at 40 °C	13
Bibliography	14

Foreword

This document EN 589:2004 has been prepared by Technical Committee CEN/TC 19 "Petroleum products, lubricants and related products", 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 July 2004, and conflicting national standards shall be withdrawn at the latest by July 2004.

This document supersedes EN 589:2000 in whole. In this fourth edition of EN 589 all relevant characteristics, requirements and test methods are specified. Significant technical changes between this European Standard and the previous edition are on:

- requirement of sulfur content
- test method for sulfur
- test method for vapour pressure, including introduction of an additional seasonal grade (E)
- requirement for methanol

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

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

In this standard Annex A, B and C are normative, Annex D is informative.

1 Scope

This European Standard specifies requirements and test methods for marketed and delivered automotive LPG (Liquefied Petroleum Gas). It 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 term “% (V/V)” is used to represent the volume fraction.

WARNING - Attention is drawn to the risk of fire and explosion when handling LPG and to the hazard to health which arises 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. All procedures should be conducted away from sources of ignition such as naked flames, unprotected electrical equipment and electrostatic hazards. Testing should be performed as far as practicable under an electrically-safe ventilation hood.

LPG in the liquid form can cause cold burns to the skin. Protective clothing such as gloves and goggles should be worn if contact with the skin is likely to occur.

Unnecessary inhalation of LPG vapour should be avoided. The operator should not be exposed to atmospheres containing more than 1 800 mg/m³ over an 8 h time-weighted average (TWA) reference period, or more than 2 250 mg/m³ over a short term, 10 min reference period. 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

This European Standard incorporates by dated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN ISO 3993:1995, *Liquefied petroleum gas and light hydrocarbons - Determination of density or relative density - Pressure hydrometer method (ISO 3993:1995).*

EN ISO 4256:1998, *Liquefied petroleum gases - Determination of gauge vapour pressure - LPG method. (ISO 4256:1996).*

EN ISO 4257:2001, *Liquefied petroleum gases - Method of sampling (ISO 4257:2001).*

EN ISO 4259:1995, *Petroleum products - Determination and application of precision data in relation to methods of test (ISO 4259:1992, including Cor.1: 1993).*

EN ISO 6251:1998, *Liquefied petroleum gases - Corrosiveness to copper - Copper strip test (ISO 6251:1996).*

EN ISO 8819:1995, *Liquefied petroleum gases - Detection of hydrogen sulfide - Lead acetate method (ISO 8819:1993).*

EN ISO 8973:1999, *Liquefied petroleum gases - Calculation method for density and vapour pressure (ISO 8973:1997).*

EN ISO 13757:1996, *Liquefied petroleum gases - Determination of oily residues - High-temperature method (ISO 13757:1996).*