

DRAFT

ÖNORM EN 589

Edition: 2008-04-15

Automotive fuels — LPG — Requirements and test methods

Kraftstoffe für Kraftfahrzeuge — Flüssiggas — Anforderungen und Prüfverfahren

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

Note:

Because of possible comments, the final version of this ÖNORM can differ from the present Draft. Please send your comments (in writing) by **2008-05-31** to ON.

Publisher and printing ON Österreichisches Normungsinstitut Austrian Standards Institute Heinestraße 38, 1020 Wien	ICS Identical (IDT) with	75.160.30 prEN 589:2008-02
Copyright © ON – 2008. All rights reserved! No part of this publication may be reproduced or utilized in any form or by any means – electronic, mechanical, photocopying or any other data carries without prior permission from ON! E-Mail: copyright@on-norm.at	Supersedes responsible	ÖNORM EN 589:2004-04 ON-Committee ON-K 024
		Petroleum products and synthetic and plant substitutes derived thereof

Sale and distribution of national and foreign standards and technical regulations via ON Österreichisches Normungsinstitut Austrian Standards Institute Heinestraße 38, 1020 Wien E-Mail: sales@on-norm.at Internet: www.on-norm.at/shop Fax: +43 1 213 00-818 Tel.: +43 1 213 00-805

Explanations concerning Draft

The present Draft European Standard **EN 589** has been submitted to CEN members for voting. In case of a positive result of the voting as required by CEN/CENELEC regulations, this Draft will be published as EN.

Like all member organizations of CEN, ON is basically obliged to implement European Standards in Austria and to withdraw conflicting standards.

ON herewith submits this Draft of a European Standard as Draft ÖNORM to public enquiry and information.

Comments on this Draft

Please find below some practical instructions intended to offer you and the competent committee assistance for the processing of comments and proposals for modification:

- Form For your comments/proposals for change, please use the relevant form available from Internet. Download under http://www.on-norm.at/normungsarbeit/einspruch.htm
- **Structure** Please use a new line for each comment. This facilitates the attribution of the comments received to the different clauses and chapters of the respective Draft.
- Language Please formulate technical comments on European Standards if possible in English, since English is the common working language of the most European standardizing bodies.
 Editorial and/or linguistic proposals for change/improvement of German versions of European Standards shall (certainly) be submitted in German.
- Script/Format Please use the script "Arial" with 9 pt font size. Please do not change the formats.
 - **Dispatch** Please send your comments by **E-Mail** to the competent Committee Manager (bettina.seitl@on-norm.at)
- Aspects concerning patent law The recipients of this Draft ÖNORM are requested to add information on any patent rights known to their comments and to provide supporting documentation, if available.

National Foreword

The national provisions required in EN 589 are being given in the following National Annex.

Annex NA National Annex

NA.1 Normative references of the National Annex

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. The current and valid version of legal provisions is to be applied.

ÖNORM EN ISO 4256, Flüssiggase – Bestimmung des Dampfdruckes – LPG-Verfahren (ISO 4256:1996) (Liquefied petroleum gases – Determination of gauge vapour pressure – LPG method (ISO 4256:1996))

ÖNORM EN ISO 4257, Flüssiggase – Probenahme (ISO 4257:2001) (Liquefied petroleum gases – Method of sampling (ISO 4257:2001))

ÖNORM EN ISO 8973, Flüssiggase – Berechnungsverfahren für die Dichte und den Dampfdruck (ISO 8973:1997)

(Liquefied petroleum gases – Calculation method for density and vapour pressure (ISO 8973:1997))

BGBI. Nr. 267/1967, Kraftfahrgesetz 1967 – KFG 1967 (Law on road vehicles 1967)

BGBI. Nr. 240/1991, Verordnung über brennbare Flüssigkeiten – VbF (Ordinance on combustible liquids)

BGBI. Nr. 194/1994, Gewerbeordnung 1994 – GewO 1994 (Ordinance on business/trade 1994)

BGBI. I Nr. 53/1997, Chemikaliengesetz 1996 – ChemG 1996 (Law on chemicals 1996)

BGBI. II Nr. 418/1999, Kraftstoffverordnung 1999 (Ordinance on automotive fuels 1999)

BGBI. I Nr. 105/2000, Bundesgesetz, mit dem ein Biozid-Produkte-Gesetz erlassen wird sowie das Lebensmittelgesetz 1975 und das Chemikaliengesetz 1996 geändert werden

NA.2 Standards denomination

In accordance with ÖNORM EN 589 LPG (Liquefied Petroleum Gas) as an automotive fuel is to be denoted as follows:

Kraftstoff ÖNORM EN 589 – Flüssiggas

The following denominations may also be used:

ÖNORM EN 589 – Flüssiggas

or

EN 589 – Flüssiggas

NA.3 ad clause 4 of EN 589

The ISO Standard quoted in this clause is also available as ÖNORM EN ISO 4257.

NA.4 ad clause 5 of EN 589

The marking of dispensing pumps shall be in accordance with the Chemikaliengesetz 1996 (Law on chemicals 1996), the Verordnung über brennbare Flüssigkeiten (Ordinance on combustible liquids) as well as the relevant (legal) specifications and conditions concerning trade and industry as such as well as the automobile industry.

NA.5 ad 6.1 of EN 589

During the winter season, 16 November to 28 February, automotive fuels have to show a minimum vapour pressure of 250 kPa (absolute) (corresponds to 150 kPa excess pressure) at a temperature of -5 °C (Grade B).

Alternatively, the determination of vapour pressure in accordance with ÖNORM EN ISO 4256 can also be carried out in accordance with ÖNORM EN ISO 8973.

NA.6 ad 6.3 of EN 589

In order to minimize the exposure of personnel conducting the tests (Annex A) the odour test can be renounced provided the experience based on production yields results which lead to the expectation that the required characteristic odour has been achieved.

EUROPEAN STANDARD NORME EUROPÉENNE EUROPÄISCHE NORM

FINAL DRAFT prEN 589

February 2008

ICS 75.160.30

Will supersede EN 589:2004

English Version

Automotive fuels - LPG - Requirements and test methods

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

Kraftstoff fur Kraftfahrzeuge - Flussiggas - Anforderungen und Prufverfahren

This draft European Standard is submitted to CEN members for unique acceptance procedure. It has been drawn up by the Technical Committee CEN/TC 19.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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 Management Centre has the same status as the official versions.

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

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



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

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

© 2008 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. prEN 589:2008: E

ÖNORM DRAFT

Contents

Forewo	ord	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	6
6.4 6.5	Density	7
0.5		1
Annex	A (normative) Test method for odour of LPG	.8
A.1	Introduction	8
A.2	Principie	ŏ
Α.3 Δ 4	Annaratus	8
A.4 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 LPG1	0
B.1	Introduction1	0
B.2	Principle1	0
B.3	Determination1	0
Б.4 В Б	Calculation and expression of results	
D.3	reporung	U
Annex	C (normative) Absolute vapour pressure blending factors (kPa)1	2
Annex	D (informative) Seasonal gauge vapour pressure limits at 40 °C1	3
Bibliog	raphy1	4

Foreword

This document (prEN 589:2008) 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 document is currently submitted to the Unique Acceptance Procedure.

This document will supersede EN 589:2004.

Differences between this document and EN 589:2004 include:

- introduction of two new test methods for residues,
- introduction of a revised specification of residue content,
- introduction of a new test method for free water detection,
- update of the values in Table C.1 in terms of the number of digits.

Next, the Technical Corrigendum on the 2004 edition on Table B.1, as published in 2005, has been incorporated.

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 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

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 15469:2007, Petroleum products – Test method for free water in liquefied petroleum gas by visual inspection

EN 15470:2007, Liquefied petroleum gases – Determination of dissolved residues - High temperature Gas chromatographic method

EN 15471:2007, Liquefied petroleum gases – Determination of dissolved residues - High temperature gravimetric method

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 4259:2006, Petroleum products - Determination and application of precision data in relation to methods of test (ISO 4259:2006)

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 24260:1994, Petroleum products and hydrocarbons - Determination of sulfur content - Wickbold combustion method (ISO 4260:1987)

EN 27941:1993, Commercial propane and butane - Analysis by gas chromatography (ISO 7941:1988)

ASTM D 3246-05, Standard test method for sulfur in petroleum gas by oxidative microcoulometry

ASTM D 6667-04, Standard test method for determination of total volatile sulfur in gaseous hydrocarbons and liquefied petroleum gases by ultraviolet fluorescence

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

liquefied petroleum gas (LPG)

petroleum gas that can be stored and/or handled in the liquid phase under moderate conditions of pressure and at ambient temperature, consisting predominantly of propane, butanes, with small proportions of propene, butenes and pentanes/pentenes

4 Sampling

Samples shall be taken as described in EN ISO 4257 and/or in accordance with the requirements of national standards or regulations for the sampling of automotive LPG. The national requirements shall be set out in detail or shall be referred to by reference in a national annex to this European Standard.

In view of the sensitivity of some of the test methods referred to in this European Standard, particular attention shall be paid to compliance with any guidance on sampling containers which is included in the test method standard.

NOTE 1 It is important that the sampling procedure is followed in detail in order to avoid evaporation losses.

NOTE 2 Before sampling from the dispenser hose, 201 of product should be pumped or recirculated, in order to obtain a representative sample.

5 Pump marking

Information to be marked on dispensing pumps used for delivering automotive LPG, and the dimensions of the mark shall be in accordance with the requirements of national standards or regulations for the marking of pumps for automotive LPG.

Such requirements shall be set out in detail or shall be referred to by reference in a national annex to this European Standard.

6 Requirements and test methods

6.1 General

When tested by the methods of test given in Table 1, automotive LPG fuel shall comply with the limiting requirements specified in that Table.

For the minimum vapour pressure, five grades, A, B, C, D and E are given to allow for seasonal limits to be set nationally for each period of the year. In a national annex to this European Standard, each country shall indicate which grade(s) it adopts to achieve a minimum vapour pressure of 150 kPa (gauge) throughout the entire year and shall detail the date range in which the selected grade applies.