

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

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dissolved residues - High temperature Gas  
chromatographic method

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 15470:2007 sisaldab Euroopa standardi EN 15470:2007 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 18.12.2007 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 15470:2007 consists of the English text of the European standard EN 15470:2007.</p> <p>This document is endorsed on 18.12.2007 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p><b>Käsitlusala:</b></p> <p>This European Standard specifies a method for determining the dissolved residual matter in liquefied petroleum gases (LPG), in the range of 40 mg/kg to 100 mg/kg. Higher concentrations can be determined by adjusting the sample size. The dissolved residue is the amount of organic compounds that are detectable by gas chromatography after evaporation of the sample at ambient temperature and then in an oven at 105 °C. This method is not suitable for detecting solid materials or for possibly high molecular weight polymers (&gt; 1 000 g/mol). The advantages of this method are that a small quantity of LPG (50 g to 75 g) is required and the qualitative data available may indicate the origin of the residues (gas-oil, lubricants, plasticizers, etc.). This method has been developed as a potential replacement of the commonly used method described in EN ISO 13757 [1], but is safer and more environmentally friendly. In addition, this new method is more accurate. The precision data of the method have been determined from 20 mg/kg to 100 mg/kg. For a higher content of residue, the precision has not been tested, but remains of lesser interest as typical specifications are in the range of 20 mg/kg to 100 mg/kg.</p>	<p><b>Scope:</b></p> <p>This European Standard specifies a method for determining the dissolved residual matter in liquefied petroleum gases (LPG), in the range of 40 mg/kg to 100 mg/kg. Higher concentrations can be determined by adjusting the sample size. The dissolved residue is the amount of organic compounds that are detectable by gas chromatography after evaporation of the sample at ambient temperature and then in an oven at 105 °C. This method is not suitable for detecting solid materials or for possibly high molecular weight polymers (&gt; 1 000 g/mol). The advantages of this method are that a small quantity of LPG (50 g to 75 g) is required and the qualitative data available may indicate the origin of the residues (gas-oil, lubricants, plasticizers, etc.). This method has been developed as a potential replacement of the commonly used method described in EN ISO 13757 [1], but is safer and more environmentally friendly. In addition, this new method is more accurate. The precision data of the method have been determined from 20 mg/kg to 100 mg/kg. For a higher content of residue, the precision has not been tested, but remains of lesser interest as typical specifications are in the range of 20 mg/kg to 100 mg/kg.</p>
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English Version

Liquefied petroleum gases - Determination of dissolved residues  
- High temperature Gas chromatographic method

Gaz de pétrole liquéfié - Détermination des résidus dissous  
- Méthode par chromatographie en phase gazeuse, à haute  
température

Flüssiggase - Bestimmung der gelösten Rückstände -  
Hochtemperatur-Gaschromatographie-Verfahren

This European Standard was approved by CEN on 7 October 2007.

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

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## Foreword

This document (EN 15470:2007) 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 May 2008, and conflicting national standards shall be withdrawn at the latest by May 2008.

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## 1 Scope

This European Standard specifies a method for determining the dissolved residual matter in liquefied petroleum gases (LPG), in the range of 40 mg/kg to 100 mg/kg. Higher concentrations can be determined by adjusting the sample size.

The dissolved residue is the amount of organic compounds that are detectable by gas chromatography after evaporation of the sample at ambient temperature and then in an oven at 105 °C.

This method is not suitable for detecting solid materials or for possibly high molecular weight polymers (> 1 000 g/mol).

The advantages of this method are that a small quantity of LPG (50 g to 75 g) is required and the qualitative data available may indicate the origin of the residues (gas-oil, lubricants, plasticizers, etc.).

This method has been developed as a potential replacement of the commonly used method described in EN ISO 13757 [1], but is safer and more environmentally friendly. In addition, this new method is more accurate.

The precision data of the method have been determined from 20 mg/kg to 100 mg/kg. For a higher content of residue, the precision has not been tested, but remains of lesser interest as typical specifications are in the range of 20 mg/kg to 100 mg/kg.

**NOTE** An alternative European Standard, EN 15471 [2], specifies a gravimetric method, which has the same scope and slightly worst fidelity data.

**WARNING — Use of this method involves hazardous materials and operations. It is the responsibility of the user to establish appropriate safety and health precautions. All handling must be performed in a fume hood.**

## 2 Normative reference

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

## 3 Terms and definitions

For the purposes of this document, the following term and definition applies.

**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/pentenenes

## 4 Principle

A known mass of LPG, between 50 g and 75 g, is sampled and evaporated in a standard small glass flask. The residue is heated in an oven at 105 °C for 1 h. It is then diluted with a solvent and one internal standard is added. The mixture is then analyzed by a capillary gas chromatography and quantified by the internal standard method.