DRAFT EAST AFRICAN STANDARD

Liquefied petroleum (LPG) — Specification

EAST AFRICAN COMMUNITY
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Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in the East African Community. It is envisaged that through harmonized standardization, trade barriers that are encountered when goods and services are exchanged within the Community will be removed.

The Community has established an East African Standards Committee (EASC) mandated to develop and issue East African Standards (EAS). The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the public and private sector organizations in the community.

East African Standards are developed through Technical Committees that are representative of key stakeholders including government, academia, consumer groups, private sector and other interested parties. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the Principles and procedures for development of East African Standards.

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

The committee responsible for this document is Technical Committee EASC/TC 068, Petroleum and petroleum products.

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Liquefied Petroleum Gas (LPG) — Specification

1 Scope

This Draft East African Standard specifies the requirements, sampling and test methods for liquefied petroleum gases (LPG) intended for use as domestic, commercial, and industrial heating and engine fuels.

This standard covers LPG consisting of commercial propane, commercial butane and commercial propane butane (PB) mixture.

2 Normative references

The following referenced documents 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.

ASTM D1267, Standard Test Method for Gauge Vapor Pressure of Liquefied Petroleum (LP) Gases (LP-Gas Method)

ASTM D1657, Standard Test Method for Density or Relative Density of Light Hydrocarbons by Pressure Hydrometer


ASTM D1838, Standard Test Method for Copper Strip Corrosion by Liquefied Petroleum (LP) Gases

ASTM D1945, Standard Test Method for Analysis of Natural Gas by Gas Chromatography

ASTM D1946, Standard Practice for Analysis of Reformed Gas by Gas Chromatography

ASTM D2158, Standard Test Method for Residues in Liquefied Petroleum (LP) Gases


ASTM D 2598, Standard Practice for Calculation of Certain Physical Properties of Liquefied Petroleum (LP) Gases from Compositional Analysis

ASTM D3244, Standard Practice for Utilization of Test Data to Determine Conformance with Specifications

ASTM D 6667, Standard Test Method for Determination of Total Volatile Sulphur in Gaseous Hydrocarbons and Liquefied Petroleum Gases by Ultraviolet Fluorescence

IP 235, Determination of density of light hydrocarbons – Pressure hydrometer method
IP 272, *Determination of mercaptan sulfur and hydrogen sulfide content of liquefied petroleum gases (LPG) - Electrometric titration method*

IP 317, *Determination of residues in liquefied petroleum gases — Low temperature evaporation method*

ISO 4257, *Liquefied petroleum gases — Method of sampling*

ISO 4259-3, *Petroleum and related products — Precision of measurement methods and results — Part 3: Monitoring and verification of published precision data in relation to methods of test*


ISO 7941, *Commercial propane and butane — Analysis by gas chromatography*

ISO 8973, *Liquefied petroleum gases — Calculation method for density and vapour pressure*


ASTM D3700, *Standard Practice for Obtaining LPG Samples Using a Floating Piston Cylinder*

ISO 13758, *Liquefied petroleum gases — Assessment of the dryness of propane — Valve freeze method*


### 3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

ISO Online browsing platform: available at [http://www.iso.org/obp](http://www.iso.org/obp)

3.1 **Liquified Petroleum Gas (LPG)**

petroleum gases that can be stored and/or handled in the liquid phase under moderate conditions of pressure and at ambient temperature. Which can be commercial butane or commercial propane or a mixture of propane and butane.

3.2 **commercial propane**

hydrocarbon product consisting mainly of propane gas for use where high volatility is required.

3.3 **commercial butane**

hydrocarbon product consisting mainly of butane gas for use where low volatility is required.

3.4 **commercial PB mixtures**

mixtures of mainly propane and butane gases for use where intermediate volatility is required.
4 Requirements

4.1 General requirements

4.1.1 LPG shall have a characteristic odour, and an appearance that is clear and free from suspended particles on visual inspection.

4.1.2 LPG shall be odourized prior to delivery to a bulk plant by the addition of a warning agent of such character that it is detectable by a distinctive odour.

4.2 Specific requirements

LPG shall comply with the requirements given in Table 1 when tested in accordance with the test methods prescribed therein.

Table 1 — Specific Requirements for LPG

<table>
<thead>
<tr>
<th>S/N</th>
<th>Characteristic</th>
<th>Requirements</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>i.</td>
<td>Density at 20°C kg/m³</td>
<td>To report</td>
<td>ASTM D1657, ASTM D 2598, IP 235, ISO 8973</td>
</tr>
<tr>
<td>ii.</td>
<td>Vapour pressure at 37.8°C kPa, max.</td>
<td>485</td>
<td>ASTM D1267, ASTM D2598, ASTM D 6897</td>
</tr>
<tr>
<td>iii.</td>
<td>Volatile residue 95% evaporated temperature 5°C, at 760 mm Hg, max.</td>
<td>2.2</td>
<td>ASTM D1837</td>
</tr>
<tr>
<td></td>
<td>Or butane and heavier %, v/v, max.</td>
<td>2.5</td>
<td>ASTM D2163, IP 405, ISO 7941</td>
</tr>
<tr>
<td></td>
<td>Or pentane and heavier percent v/v, max.</td>
<td>2.0</td>
<td>ASTM D2163, IP 405, ISO 7941</td>
</tr>
<tr>
<td>v</td>
<td>Nitrogen</td>
<td>Nil</td>
<td>ASTM D1945, ASTM D1946, ASTM D 2504</td>
</tr>
<tr>
<td>vi</td>
<td>Oxygen</td>
<td>Nil</td>
<td>ASTM D1945, ASTM D1946, ASTM D 2504</td>
</tr>
<tr>
<td>vii</td>
<td>Residue on evaporation of 100 ml, max.</td>
<td>0.05</td>
<td>ASTM D2158, IP 317</td>
</tr>
<tr>
<td>viii</td>
<td>Oil stain observation</td>
<td>pass</td>
<td>ASTM D2158, IP 317</td>
</tr>
<tr>
<td>ix</td>
<td>Corrosion, copper strip (1h at 37.8°C, max.</td>
<td>No.1</td>
<td>ASTM D1838</td>
</tr>
<tr>
<td>x</td>
<td>Total sulphur mg/kg, max.</td>
<td>140</td>
<td>ASTM D 6667, ASTM D 5453</td>
</tr>
</tbody>
</table>
5 Packaging

5.1 The LPG shall be packed in certified gas containers, that conform to relevant international or regional standards.

5.2 The containers shall be acceptably sealed.

6 Labelling

6.1 The following information shall be clearly marked on the container, or on a label affixed to the container:

   a) supplier's name or brand name or trade mark;

   b) Product name as “LPG”;

   c) type of liquefied petroleum gas;

   d) serial number;

   e) net weight in Kilograms (kg);

   f) water capacity in litres;

   g) Date of manufacture of the container;

   h) Manufacturer of the container;

   i) standard to which the container was manufactured;

   j) gross/ tare weight of the container in kg;

   k) date of last pressure test of the container; and
1) precautionary labels that apply to safety and proper handling of LPG in accordance to ISO 7225

6.2 For bulk transportation the above information shall be in the documentation accompanying the product.

7 Sampling

Sampling of LPG shall be done in accordance with ISO 4257 or ASTM D1265 or ASTM D3700
Bibliography
