SRI LANKA STANDARD 712:2021
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SPECIFICATION FOR LIQUEFIED PETROLEUM GAS (LPG) (AS PROPANE, BUTANE MIXTURE)

(Second Revision)

SRI LANKA STANDARDS INSTITUTION

Sri Lanka Standard

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SLS 712: 2021

Gr.3

SRI LANKA STANDARDS INSTITUTION
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SRI LANKA

Sri Lanka Standards are subject to periodical revision in order to accommodate the progress made by industry. Suggestions for improvement will be recorded and brought to the notice of the Committees to which the revisions are entrusted.

This Standard does not purport to include all the necessary provisions of a contract

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FOREWORD

This standard was approved by the Sectoral Committee on Materials, Mechanical Systems and Manufacturing Engineering and was authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 2021-12-16.

This standard which prescribes requirements and methods of test for liquefied petroleum gas (as propane, butane mixture), supplied in cylinders or bulk, was first published in 1985 and subsequently revised in 1998. This is the second revision of the standard. Commercial propane, special duty propane and commercial butane have been excluded in this revision.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value observed or calculated, expressing the result of a test or an analysis shall be rounded off in accordance with **SLS 102**. The number of significant figures to be retained in the rounded off value shall be the same as that of the specified value in this standard.

In the preparation of this standard the assistance derived from the publications of American Society for Testing and Materials (ASTM) and British Standards Institute (BSI) are gratefully acknowledged.

1 SCOPE

This standard specifies requirements and methods of sampling and testing for liquefied petroleum gas (as propane, butane mixture), supplied in cylinders or bulk, intended for use in domestic, commercial and industrial and engine fuel.

2 REFERENCES

BS 4250	Commercial butane and commercial propane
SLS 1178	Transportable welded steel gas containers for LPG
SLS ASTM D1267	Gauge Vapor Pressure of LPG (LP-Gas Method)
SLS ASTM D1657	Density or Relative Density of Light Hydrocarbons by Pressure Hydrometer
SLS ASTM D1838	Copper Strip Corrosion by LPG
SLS ASTM D2158	Residues in LPG
SLS ASTM D2163	Hydrocarbons in LPG and Propane/Propene Mixtures by Gas Chromatography
SLS ASTM D2420	Hydrogen Sulfide in LPG (Lead Acetate Method)
SLS ASTM D2598	Physical Properties of LPG from Compositional Analysis
SLS ASTM D3246	Sulfur in Petroleum Gas by Oxidative Microcoulometry
SLS ASTM D5305	Ethyl Mercaptan in LP-Gas Vapor

SLS ASTM D6667	Total Volatile Sulfur in Gaseous Hydrocarbons and LPG by Ultraviolet Fluorescence
SLS ASTM D6897	Vapor Pressure of LPG (Expansion Method)
SLS ISO 1998-1	Petroleum industry – Terminology – Part 1: Raw materials and products
SLS ISO 1998-2	Petroleum industry – Terminology – Part 2: Properties and tests
SLS ISO 1998-3	Petroleum industry – Terminology – Part 3: Exploration and production
SLS ISO 1998-4	Petroleum industry – Terminology – Part 4: Refining
SLS ISO 1998-5	Petroleum industry – Terminology – Part 5: Transport, storage, distribution
SLS ISO 1998-6	Petroleum industry – Terminology – Part 6: Measurement
SLS ISO 1998-7	Petroleum industry – Terminology – Part 7: Miscellaneous terms
SLS ISO 1998-99	Petroleum industry – Terminology – Part 99: General and index
SLS ISO 4257	Liquefied petroleum gases — Method of sampling

3 DEFINITIONS

For the purpose of this standard, definitions given in all parts of **SLS ISO 1998** and following definitions shall apply.

3.1 **LPG**: Narrow boiling range mixture of hydrocarbons consisting of propane, propylene, butanes and butylenes, individually or in specified combinations, with limited amounts of other hydrocarbons (such as ethane) and naturally occurring, petroleum-derived non-hydrocarbons.

3.2 **manufacturer**: The establishment that fill LPG (as propane, butane mixture) into the cylinder

3.3 **lot**: Each filled cylinder belonging to one batch of manufacture

4 REQUIREMENTS

The LPG (as propane, butane mixture) shall conform to the requirements specified in Table **1**, when tested in accordance with the methods specified in Column **4** of Table **1**.

TABLE 1 – Requirements of liquefied petroleum gas (as propane, butane mixture)

Property (1)	Unit (2)	Requirement (3)	Test Method (4)
Vapour pressure at 37.8 ^{0}C, max Vapour pressure at 37.8 ^{0}C, min	kPa	637 [a] 414	**SLS ASTM D1267** or **SLS ASTM D2598** or **SLS ASTM D6897**
Propane, max	% vol	30	**SLS ASTM D2163**
Butane	% vol	Report [b]	
C5 and higher HC content , max	% vol	2.0	
Dienes content, max	% vol	0.5	
Alkynes content, max	% vol	0.5	
Volatile residue, evaporated temperature, 95%,max	^{0}C	2.0	**SLS ASTM D2158**
Residue on evaporation 100ml, max,	ml	0.05	
Oil stain observation	-	pass	
Relative density at (15.6 ^{0}C /15.6 ^{0}C)	-	Report	**SLS ASTM D1657** or **SLS ASTM D2598**
Corrosion, copper strip, 2h at 37.8 ^{0}C, max	-	Class 1	**SLS ASTM D 1838**
Sulphur ,max	ppm	200	**SLS ASTM D6667** or **SLS ASTM D3246**
Hydrogen sulphide	-	Pass the test	**SLS ASTM D2420**
Free water content	-	None	Visual inspection
Odour , min (vapor phase)	ppm	14 for ethanethiol (ethyl mercaptan) or 77 for tetrahydrothiophene	**SLS ASTM D5305**

[a] Calculated as per **SLS ASTM D2598**
[b] Butane percentage shall be decided to meet the vapour pressure limits

5 SAFETY

5.1 Each and every filled cylinder shall comply with gas tightness test as specified in **SLS 1178**.

5.2 The cylinder shall be revalidated for the conformity of **SLS 1178** at every five years and shall mark the test date on the collar of the cylinder.

5.3 Manufacturer shall be responsible for issuing of safety instructions at each first purchase of a cylinder by a consumer.

6 MARKING

The LPG (as propane, butane mixture) manufactured or filled in compliance with this standard, shall be marked on the cylinder, legibly and indelibly with the particulars given from a) to j) as follows:

a) Generic name of the product;
   that is : LPG (as propane, butane mixture)
b) Manufacturer's name or trade mark if any;
c) Tare weight;
d) Net weight;
e) Test date of revalidation of the cylinder (see **5.2**);
f) The words "Extremely Flammable"
g) Following international identification symbol for flammable chemicals;

h) The words "Leak test passed" (see **5.1**);
i) Precautionary and safety advice; and
j) Any other marking imposed by legislation.

NOTE: *Attention is drawn to certification facilities offered by Sri Lanka Standards Institution. See the inside back cover of this standard.*

7 MANUFACTURER'S CERTIFICATE

Manufacturer on request shall issue a report providing the test information given from a) to c) as follows:

a) Test results relevant to requirements in Table **1**;
b) Test result of gas tightness test; and
c) Test date of revalidation of the cylinder.

8 PACKAGING

LPG (as propane, butane mixture) shall be filled in cylinders, conforming to **SLS 1178**.

9 SAMPLING AND CRITERIA FOR CONFORMITY

9.1 Sampling shall be in accordance with **SLS ISO 4257**.

9.2 If LPG (as propane, butane mixture) and filled LPG (as propane, butane mixture) cylinder does not conform to one or more of the requirements specified in this standard, it shall be declared as not conforming to the requirements of this standard.

9.3 If LPG (as propane, butane mixture) and filled LPG (as propane, butane mixture) cylinders conform to all the requirements specified in this standard, it shall be declared as conforming to the requirements of this standard.

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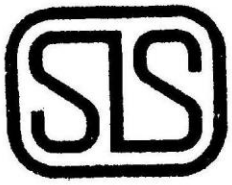
SLS CERTIFICATION MARK

The Sri Lanka Standards Institution is the owner of the registered certification mark shown below. Beneath the mark, the number of the Sri Lanka Standard relevant to the product is indicated. This mark may be used only by those who have obtained permits under the SLS certification marks scheme. The presence of this mark on or in relation to a product conveys the assurance that they have been produced to comply with the requirements of the relevant Sri Lanka Standard under a well designed system of quality control inspection and testing operated by the manufacturer and supervised by the SLSI *which includes surveillance inspection of the factory, testing of both factory and market samples.*

Further particulars of the terms and conditions of the permit may be obtained from the Sri *Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.*



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SRI LANKA STANDARDS INSTITUTION

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The principal objects of the Institution as set out in the Act are to prepare standards and promote their adoption, to provide facilities for examination and testing of products, to operate a Certification Marks Scheme, to certify the quality of products meant for local consumption or exports and to promote standardization and quality control by educational, consultancy and research activity.

The Institution is financed by Government grants, and by the income from the sale of its publications and other services offered for Industry and Business Sector. Financial and administrative control is vested in a Council appointed in accordance with the provisions of the Act.

The development and formulation of National Standards is carried out by Technical Experts and representatives of other interest groups, assisted by the permanent officers of the Institution. These Technical Committees are appointed under the purview of the Sectoral Committees which in turn are appointed by the Council. The Sectoral Committees give the final Technical approval for the Draft National Standards prior to the approval by the Council of the SLSI.

All members of the Technical and Sectoral Committees render their services in an honorary capacity. In this process the Institution endeavours to ensure adequate representation of all view points.

In the International field the Institution represents Sri Lanka in the International Organization for Standardization (ISO), and participates in such fields of standardization as are of special interest to Sri Lanka.

Printed at the Sri Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.