

**Draft SRI LANKA STANDARD 712:2021**

**SPECIFICATION FOR  
LIQUIFIED PETROLEUM GAS (LPG)  
(Second Revision)**

**SRI LANKA STANDARDS INSTITUTION**

**Draft Sri Lanka Standard**  
**SPECIFICATION FOR LIQUID PETROLEUM GAS (LPG)**  
**(Second Revision)**

**SLS 712 : 2021**

For public comments

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**SPECIFICATION LIQUIFIED PETROLEUM GAS**  
**(Second Revision)**

**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-xx-xx.

This standard which prescribes requirements and methods of test for liquefied petroleum gas, 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 (hereinafter referred to as LPG) supplied in cylinders or bulk, intended for use in domestic, commercial and industrial and engine fuel.

## 2 REFERENCES

<b>BS 4250</b>	Commercial butane and commercial propane
<b>SLS ASTM D1267</b>	Gauge Vapor Pressure of LPG (LP-Gas Method)
<b>SLS ASTM D1657</b>	Density or Relative Density of Light Hydrocarbons by Pressure Hydrometer
<b>SLS ASTM D1838</b>	Copper Strip Corrosion by LPG
<b>SLS ASTM D2158</b>	Residues in LPG
<b>SLS ASTM D2163</b>	Hydrocarbons in LPG and Propane/Propene Mixtures by Gas Chromatography
<b>SLS ASTM D2420</b>	Hydrogen Sulfide in LPG (Lead Acetate Method)
<b>SLS ASTM D2598</b>	Physical Properties of LPG from Compositional Analysis
<b>SLS ASTM D3246</b>	Sulfur in Petroleum Gas by Oxidative Microcoulometry
<b>SLS ASTM D6667</b>	Total Volatile Sulfur in Gaseous Hydrocarbons and LPG by Ultraviolet Fluorescence
<b>SLS ASTM D6897</b>	Vapor Pressure of LPG (Expansion Method)
<b>SLS ISO 1998-1</b>	Petroleum industry – Terminology – Part 1: Raw materials and products
<b>SLS ISO 1998-2</b>	Petroleum industry – Terminology – Part 2: Properties and tests
<b>SLS ISO 1998-3</b>	Petroleum industry – Terminology – Part 3: Exploration and production
<b>SLS ISO 1998-4</b>	Petroleum industry – Terminology – Part 4: Refining
<b>SLS ISO 1998-5</b>	Petroleum industry – Terminology – Part 5: Transport, storage, distribution
<b>SLS ISO 1998-6</b>	Petroleum industry – Terminology – Part 6: Measurement
<b>SLS ISO 1998-7</b>	Petroleum industry – Terminology – Part 7: Miscellaneous terms
<b>SLS ISO 1998-99</b>	Petroleum industry – Terminology – Part 99: General and index
<b>SLS ISO 4257</b>	Liquefied petroleum gases — Method of sampling
<b>SLS 1178</b>	Transportable welded steel gas containers for LPG

## 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 into the cylinder

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

#### 4 REQUIREMENTS

The LPG shall conform to the requirements specified in Table 1, when tested in accordance with the methods specified in Column 2 of Table 1.

**TABLE 1 – Requirements of liquefied petroleum gases**

Property (1)	Unit (2)	Requirement (3)	Test Method (4)
Vapour pressure at 37.8 °C, max,	kPa	1050	ASTM D1267 or ASTM D2598 or ASTM D6897
Propane	% vol	Report	ASTM D2163
Butane	% vol	Report	
C5 and higher HC content , max	% mol	2.0	
Dienes content, max	% mol	0.5	
Alkynes content, max	% mol	0.5	
Volatile residue, evaporated temperature, 95%,max	°C	2.0	ASTM D2158
Residue on evaporation 100ml, max,	ml	0.05	
Oil stain observation	-	pass	
Relative density at (15.6 °C /15.6 °C)	-	Report	ASTM D1657 or ASTM D2598
Corrosion, copper strip, 2h at 37.8 C, max	-	Class 1	ASTM D 1838
Sulphur ,max	ppm	200	ASTM D6667 or ASTM D3246
Hydrogen sulphide	-	Pass the test	ASTM D2420
Free water content	-	None	Visual inspection
Odour <sup>a</sup>	-	Distinctive and unpleasant at 20% of the lower flammable limit	Annex B of BS 4250 <sup>b</sup>

<sup>a</sup> *Odourants such as ethanethiol, tetrahydrothiophene or dimethyl sulfide may be added so that the gas conforms to this requirement, provided that LPG is still in accordance with Table 1.*

*If ethanethiol (ethyl mercaptan) is added as an odorant, it may be assumed that LPG conforms to the above odour requirements, provided that the content of ethanethiol in the liquid phase is not less than 14 cm<sup>3</sup>/m<sup>3</sup>.*

*If tetrahydrothiophene is added as an odorant, a higher concentration than that for ethanethiol is required because of the lower olfactory response of tetrahydrothiophene. It may be assumed that the product conforms to the above odour requirements, provided that the content of tetrahydrothiophene in the liquid phase is not less than 77 cm<sup>3</sup>/m<sup>3</sup>.*

- <sup>b</sup> *In order to minimize the exposure of personnel conducting the odour test, it is strongly recommended that the test should only be performed when it has been ascertained that LPG is still in accordance with Table 1.*

*The test involves the operator inhaling a mixture of commercial butane or commercial propane vapour and air. There is a risk that the short-term and/or long-term (8 h Time Weighted Average reference period) occupational exposure limits for substances contained in LPG might be exceeded. The operator should consult relevant safety and health regulations and ensure that exposure during the sampling, handling and testing of LPG does not exceed the prescribed limits.*

*As a guide, and provided LPG being tested conforms to the requirements specified in Table 1, an operator normally remains within recommended occupational exposure limits provided inhalation of LPG/air mixture does not exceed three 10 s periods during each test and not more than two tests per hour are performed in the course of an 8 h working day. This guidance only takes account of the operator's exposure whilst conducting odour tests. Other potential exposures should be assessed in order to estimate total exposure.*

## **6 SAFETY**

- 6.1** Each and every filled cylinder shall comply with gas tightness test as specified in **SLS 1178**.
- 6.2** 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.
- 6.3** Manufacturer shall be responsible for issuing of safety instructions at each first purchase of a cylinder by a consumer.



## 7 MARKING

The LPG 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
- b) Manufacturer's name or trade mark if any;
- c) Tare weight;
- d) Net weight;
- e) Test date of revalidation of the cylinder (see 6.2);
- f) The words "Extremely Flammable"
- g) Following international identification symbol for flammable chemicals;



- h) The words "Leak test passed" (see 6.1);
- 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.

## 8 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.

## 9 PACKAGING

LPG shall be filled in cylinders, conforming to SLS 1178.

## 10 SAMPLING AND CRITERIA FOR CONFORMITY

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

**10.2** If LPG and filled LPG 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.

**10.3** If LPG and filled LPG 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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