

الهيئة السعودية للمواصفات والمقاييس والجودة

Saudi Standards, Metrology and Quality Org (SASO)

SASO FDS 84:2023

Liquefied petroleum gases (LPG) for household use (mixture of commercial propane and butane)

ICS: 75.160.30

THIS DOCUMENT IS A DRAFT SAUDI STANDARD CIRCULATED FOR COMMENT. IT IS, THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS A SAUDI STANDARD UNTIL APPROVED BY THE BOARD OF DIRECTORS.

Foreword

Saudi Standards, Metrology and Quality Organization (SASO) has updated the Saudi Standard No. (84:2023) "Liquefied petroleum gases (LPG) for household use (mixture of commercial propane and butane)" Based on Relevant ADMO, International and National foreign Standards and references.

The approved Saudi Standard will replace and supersede the Saudi Standard No. (84:2010).

Petroleum Liquefied Gas – mixture of commercial propane and butane

1. SCOPE

- 1.1. This standard is concerned with specification and requirement for the Liquefied Petroleum Gases (LPG) used as commercial or industrial fuel for local use in the Kingdom of Saudi Arabia.
- 1.2. This standard does not purport to address all the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. COMPLEMENTARY REFERENCES

- 2.1. GSO 673 “Test Methods for Liquefied Petroleum Gases (LPG)”.
- 2.2. SASO ASTM D2163 “Standard Test Method for Determination of Hydrocarbons in Liquefied Petroleum (LP) Gases and Propane/Propene Mixtures by Gas Chromatography”.
- 2.3. SASO ASTM D1838 “Test Method for Copper strip corrosion by LPG”.
- 2.4. SASO GSO ASTM D2420 “Standard test method for hydrogen sulfide in liquefied petroleum (LP) gases (lead acetate method)”.
- 2.5. UOP 212 “Determination of Hydrogen Sulfide, Mercaptan Sulfur and Carbonyl Sulfide in Hydrocarbon Gases by Potentiometric Titration”.
- 2.6. UOP 791 “Sulfur Components in LPG Fractions by GC-SCD”.
- 2.7. SASO ASTM D6273 “Standard Test Method for Natural Gas Odor Intensity”.
- 2.8. GSO ASTM D2598 “Practice for calculation of certain Physical Properties of LPG from compositional analysis”.
- 2.9. SASO ASTM D1267 “Test Method for Gauge Vapor Pressure of LPG”.
- 2.10. ASTM D6897 “Standard Test Method for Vapor Pressure of Liquefied Petroleum Gases (LPG) (Expansion Method)”.
- 2.11. SASO ASTM D4045 “Standard Test Method for Sulfur in Petroleum Products by Hydrogenolysis and Rateometric Colorimetry”.
- 2.12. SASO ASTM 6667 “Standard Test Method for Determination of Total Volatile Sulfur in Gaseous Hydrocarbons and Liquefied Petroleum Gases by Ultraviolet Fluorescence”.
- 2.13. GSO ISO 4257 “Liquefied petroleum gases - Method of sampling”.
- 2.14. GSO 60 “Industrial Safety and Health Regulations - Hazardous Materials - Gases – Part 6: Liquefied Petroleum Gases”.

3. DEFINITIONS

Liquid Petroleum Gas (LPG):

A mixture of hydrocarbons principally propane and butane obtained from refinery gases, Natural Gas Liquid Condensate, Heavy Oil etc which can be stored and handled as liquid at ambient temperature and moderate pressure used as domestic, commercial and industrial gas fuel.

4. CHARACTERISTICS

Following characteristics and requirements must be available in the LPG:

- 4.1. It should be stored as liquid and used as gas.
- 4.2. It should be suitable for use as domestic and industrial fuel.
- 4.3. It may contain additive including mercaptans for odor.
- 4.4. It should be free from water and sediments.
- 4.5. It should comply with the requirements covered by Table of “The Characteristics and Requirements for LPG”.

5. Sampling Method

Samples should be obtained from storage tanks for testing and inspection in accordance with standard of sampling mentioned in item 2.13.

6. Testing and Inspection

Inspection and testing of samples for determining the characteristics and specifications mentioned in Table (1) of Characteristics and Requirements” are made according to the testing methods for each characteristic according to standards either in Items 2.1 – 2.12 or equivalent standard in the Items as mentioned in Table (2).

7. Terms of Technical Applications

LPG is deemed in accordance with this standard if the results of tests and inspection of the sample taken as indicated in the testing method referred to under clause 5 are found in compliance with the characteristics and requirements mentioned under clause 4 and if found inconsistent with one or more of such characteristics it will be then deemed noncompliant.

TABLE (1)
The Characteristics and Requirements for LPG

PROPERTY	UNITS	LIMIT	TEST METHOD
Composition, Liquid Propane Butanes Pentanes and heavier	Liq vol % Liq vol % Liq vol %	Report Report Max 2.0	Table (2)/ Item 2
Copper Corrosion strip	—	Max No. 1	Table (2)/ Item 3
Hydrogen Sulfide (note b)	—	Pass	Table (2)/ Items 4,5 or 6
Odor	—	Positive	Table (2)/ Item 7
Specific Gravity at 15.6 °C/15.6 °C (60 °F/60 °F)	—	Report	Table (2)/ Item 8
Vapor Pressure at 37.8 °C A. Summer Grade (May, June, Aug. and Sep.) B. Off-Season Grade (Mar., Apr., Oct. and Nov.) C. Winter Grade (Dec., Jan. and Feb.)	psig (kpa(g))	Min – Max 75-100 (517-690) Min – Max 90-115 (621-793) Min – Max 105-130 (724-896)	Table (2)/ Items 8, 9 or 10
Total Sulfur	mg/kg (or ppm wt)	Max 200	Table (2)/ Item 12
Free Water Content	—	None	Visual

Notes:

- a) This product is typically sold as “Cooking Gas”.
- b) Hydrogen sulfide test is required when volatile sulfur test exceeds 5 ppm. SASO GSO ASTM D2420 reports test results as “Pass” or “Fail”. When either UOP 212 or UOP 791 is used, “Pass” will be less than or equal to 5 mass-ppm.

TABLE (2)
Standard Test Methods for LPG

#	Standard No.	Standard Title
1	GSO 673	Test Methods for Liquefied Petroleum Gases (LPG)
2	SASO ASTM D2163	Standard Test Method for Determination of Hydrocarbons in Liquefied Petroleum (LP) Gases and Propane/Propene Mixtures by Gas Chromatography
3	SASO ASTM D1838	Test Method for Copper strip corrosion by LPG
4	SASO GSO ASTM D2420	Standard test method for hydrogen sulfide in liquefied petroleum (LP) gases (lead acetate method)
5	UOP 212	Determination of Hydrogen Sulfide, Mercaptan Sulfur and Carbonyl Sulfide in Hydrocarbon Gases by Potentiometric Titration
6	UOP 791	Sulfur Components in LPG Fractions by GC-SCD
7	SASO ASTM D6273	Standard Test Method for Natural Gas Odor Intensity
8	GSO ASTM D2598	Practice for calculation of certain Physical Properties of LPG from compositional analysis
9	SASO ASTM D1267	Test Method for Gauge Vapor Pressure of LPG
10	ASTM D6897	Standard Test Method for Vapor Pressure of Liquefied Petroleum Gases (LPG) (Expansion Method)
11	SASO ASTM D4045	Standard Test Method for Sulfur in Petroleum Products by Hydrogenolysis and Rateometric Colorimetry
12	SASO ASTM 6667	Standard Test Method for Determination of Total Volatile Sulfur in Gaseous Hydrocarbons and Liquefied Petroleum Gases by Ultraviolet Fluorescence

Main References

-Aramco Specifications A-150
“Liquefied Petroleum gas”
Issued date 16/06/2022

المراجع الأساسية

-مواصفات أرامكو رقم أ- 150
"غاز البترول المسال"
تاريخ الاصدار 2022/06/16

Other References

American Society for Testing and Material
“Standard Specification for Liquefied
Petroleum (LP) Gases” ASTM D1835
Issued date 27/07/2022

المراجع الأخرى

الجمعية الأمريكية للاختبار والمواد
"المواصفات القياسية للغازات البترولية"
المسألة ASTM D1835
تاريخ الاصدار 2022/07/27