



المسودة النهائية

الغاز البترولي المسال - خليط البروبان والبيوتان
Liquified Petroluem Gas- propane butane mixture

إعداد
دائرة المواصفات
المديرية العامة للمواصفات والمقاييس
وزارة التجارة والصناعة

ICS:75:160.30

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تقديم

المديرية العامة للمواصفات والمقاييس جهاز التقييس الوطني بالسلطنة أنشئت بموجب المرسوم السلطاني رقم 1976/39، ومن مهامها إعداد المواصفات القياسية العمانية واللوائح الفنية إستناداً للمرسوم السلطاني رقم 87/1 وقد قامت دائرة المواصفات بالمديرية بإعداد هذه المواصفة القياسية العمانية " الغاز البترولي المسال - خليط البروبان والبيوتان " وقد تم إعداد المشروع باللغة الإنجليزية بعد إستعراض المواصفات القياسية العربية والأجنبية والدولية والمؤلفات المرجعية ذات الصلة.

وقد اعتمدت هذه المواصفة كمواصفة قياسية عمانية بتاريخ / / هـ، الموافق / / م

Forward

General Directorate of Standardization and Metrology (DGSM) is the National standard body in Sultanate of Oman. It was established according to Royal Decree No. 39/1976. DGSM is responsible of issuing Omani standards and technical regulations.

Director of standards, in the DGSM has prepared this standard "Liquified Petroleum Gas- propane butane mixture .The draft standard has been prepared in English language based on relevant international and National foreign standard and references,

This standards was approved as an Omani Standard on / / H, / / G

Liquefied Petroleum Gas- propane butane mixture

1. Scope:

This Omani Standard is concerned with specification and requirement for the Propane & Butane mixture used as domestic or industrial heating fuel.

NOTE: For the purposes of this Standard, the terms “% (m/m)” and “% (V/V)” are used to represent the mass fraction and the volume fraction respectively.

2. Complementary References:

- 2.1 GSO 60/1987 Industrial Safety and Health Requirements-Liquefied Petroleum Gas.
- 2.2 GSO 673/1997: Methods of Testing Liquefied Petroleum Gases(LPG)- A mixture of Commercial Propane and Butane.
- 2.3 ASTM D1838-16 : Standard Test Method for Copper Strip Corrosion by Liquefied Petroleum (LP) Gases.
- 2.4 ASTM D6667-14: Test Method for Determination of Total Volatile Sulfur in Gaseous Hydrocarbons and Liquefied Petroleum Gases by Ultraviolet Fluorescence.
- 2.5 IP 272: Determination of Mercaptan and Hydrogen Sulphide content of LPG – electrometric titration method.
- 2.6 UOP 212-05 :Determination of Hydrogen Sulphide, Mercaptan Sulphur and Carbonyl Sulphide in Hydrocarbon Gases by Potentiometric Titration.
- 2.7 GSO ASTM D2420-13(2018):Standard test method for hydrogen sulfide in liquefied Petroleum (LP) gases (lead acetate method).
- 2.8 ASTM D 5504-12: Standard Test Method for Determination of Sulfur Compounds in Natural Gas and Gaseous Fuels by Gas Chromatography and Chemiluminescence.
- 2.9 ASTM D2784-11: Standard Test Method for Sulfur in Liquefied Petroleum Gases (Oxy-Hydrogen Burner or Lamp).
- 2.10 ASTM D1266-18: Standard Test Method for Sulfur in Petroleum Products (Lamp Method).
- 2.11 ASTM D 2598-16: Practice for calculation of certain Physical Properties of LPG from compositional analysis.
- 2.12 ASTM D1267-12:Standard Test Method for Gage Vapor Pressure of Liquefied Petroleum (LP) Gases (LP-Gas Method).
- 2.13 ASTM D6897 – 16:Standard Test Method for Vapor Pressure of Liquefied Petroleum Gases (LPG) (Expansion Method).
- 2.14 GSO ASTM D1837-17: Standard test method for volatility of liquefied petroleum (LP) gases

- 2.15 GSO ASTM D2158-16:Standard test method for residues in liquefied petroleum (LP) gases.
- 2.16 ASTM D2163 - 14e1: Standard Test Method for Determination of Hydrocarbons in Liquefied Petroleum (LP) Gases and Propane/Propene Mixtures by Gas Chromatography.
- 2.17 GSO ISO 4257/2008: Liquefied petroleum gases - Method of sampling.
- 2.18 ASTM D3700 - 16 :Standard Practice for Obtaining LPG Samples Using a Floating Piston Cylinder.
- 2.19 ASTM D1265 - 11(2017)e1:Standard Practice for Sampling Liquefied Petroleum (LP) Gases, Manual Method

3. Definitions:

- 3.1 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 LPG can be used for domestic,commercial and industrial .
- 3.2 PB mixtures, n—mixtures of propane and butane for use where intermediate volatility is required.

4. Characteristics:

- 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 should be free from water and sediments.
- 4.4 Odour: The distinctive smell that people associate with LPG is actually added to it as a safety measure.Without the addition of an odourant, leaking gas could collect without being detected.(Mercaptan sulphate or Ethyl Mercaptan, can be used as an odourent)
- 4.5 it should not conflict with standard in 2.1.
- 4.6 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 standards of sampling mentioned in 2.17 or 2.18 or 2.19.

Table of “The Characteristics and Requirements for LPG”

PROPERTY	UNITS	LIMITS	TEST METHOD
Copper Corrosion 1 h @ 37.8 °C	—	Max 1	ASTM D1838 GSO 673
Free Water	—	NONE	visual
Total Mercaptan	mg/kg (ppm)	Min 15 Max 60	UOP212 IP 272
Hydrogen sulphide	mg/kg (ppm)	pass or Negative	UOP 212 ASTM D2420
Total Sulphur	mg/kg(ppm)	Max 140	ASTM D6667 GSO 673 ASTM D 5504 ASTM D2784 ASTM D1266
Density at 15°C or relative density at 15.6/15.6 °C (60/60 °F)	kg/l	Report	ASTM D2598
Vapour Pressure at 37.8 °C	kpa	Max700	GSO 673 ASTM D 2598 ASTM D1267 ASTM D6897
	Kpa (g)	Max 670	
Volatile Residue:			
Evaporated Temperature @95%,	°C	Max 2.2	ASTM D1837
Hydrocarbon Composition			
Methane	Liq vol %	report	ASTM D 2163
Ethane		Max 2.0	
Propane		Max 42	
Butane		Report	
Pentane and Heavier	vol %	Max 2.0	ASTM D2163

*NOTE: requirement of Mercaptan is: to detect the Odour.

Abbreviation

1. **GSO:** Gulf Standardization Organization
2. **ASTM:** American Society for Testing and Materials.
3. **ISO:** International Organization for Standardization.
4. **IP TEST METHODS:** The Energy Publication institution develop and publish international test method standards known as IP Test Methods) for petroleum and related products.

References:

1. ASTM D1835 – 16: Standard Specification for Liquefied Petroleum (LP) Gases.
www.astm.org
2. GSO 672/2010: Petroleum liqefied Gas-mixture of commercial propane and butane.
www.gso.org.sa