

**Petroleum products – Liquefied petroleum gases (LPG) –
Specification**

Foreword

This Philippine National Standard PNS/DOE QS 005:2016, specification for Liquefied Petroleum Gas (LPG) was prepared by the Department of Energy through the Technical Committee on Petroleum Products and Additives (DOE/TCPA) and was approved for adoption as Philippine National Standard by the Bureau of Philippine Standards.

This standard is a revision of PNS/DOE QS 005:2005 with improvement made in the requirement on the use of odorant for health and safety consideration as well as to update the test methods.

This standard cancels and replaces PNS/DOE QS 005:2005.

Further, this is in line with the DOE's policy and program of updating the fuel quality specification of LPG in terms of the current requirements of the industry, its users and manufacturers and also by endeavoring to harmonize international/regional environmental standards for fuel quality.

This standard is subject for review when necessary.

1 Scope

This standard specifies the requirements for liquefied petroleum gases (LPG) used for purposes other than motor fuel.

2 References

The titles of the standards publications referred to in this standard are listed on the inside back cover.

3 Definitions

For the purpose of this standard, the following definitions apply:

3.1

butane

a gas that is composed of either or both of two isomeric, flammable, gaseous hydrocarbons, C₄H₁₀ of the paraffin series: n-butane or isobutene.

3.2

liquefied petroleum gas (LPG)

a gas liquefied by compression consisting of flammable hydrocarbons predominantly propane and butane or their mixture

3.3

propane

a gaseous paraffin hydrocarbon C₃H₈ present in natural gas and crude oil

3.4

propane-butane mixture

a mixture of propane and butane for use where intermediate volatility characteristics are desired

4 Classification

4.1 Type 1 – Propane (C3)

4.2 Type 2 – Propane Butane (C3-C4 Mixture) for Domestic and Industrial Fuels

4.3 Type 3 – Butane (C4)

5 Requirements

5.1 The three types of LPG shall conform to the requirements in Table 1.

Table 1 – Chemical and physical requirements for LPG

	Type 1 Propane (C3)	Type 2 (C3-C4 Mixture) Domestic & Industrial Fuel	Type 3 Butane (C4)	Test Method
Copper Corrosion 1 h at 37.8°C, max.	No. 1	No. 1	No. 1	PNS ASTM D1838
Free Water Content	None	None	None	Visual
Sulfur, mass ppm, max. (before stenching)	140	140	140	PNS ASTM D2784
Vapor Pressure, at 37.8°C, kPa, max.	1430	1050	485	PNS ASTM D1267 or PNS ASTM D2163
Volatile Residue, 95% Boiling point at 760 Mm Hg, °C, max. or Butane & heavier, % by vol., max. Pentane & heavier % by vol., max.	-38.3 2.5	2.2 2.0	2.2 2.0	PNS ASTM D1837 PNS ASTM D2163 PNS ASTM D2163
Note: Except for specialized industrial uses, the above finished products shall contain a mercaptan compound that would result to an offensive discernible odor. The amount of odorant to be used is covered by relevant NFPA 58 provisions. Other candidates for odorant shall be subject for review for health and toxicity consideration.				

6 Sampling

Sampling of LPG shall be in accordance with PNS ASTM D 1265.

7 Test Methods

LPG shall be tested in accordance with the methods specified in table 1.

References:

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced documents (including any amendments) applies:

PNS ASTM D 1267:2012 (ASTM published ____), Standard Test Method for Gage Vapor Pressure of Liquefied Petroleum (LP) Gases (LP-Gas Method)

PNS ASTM D1837:2011 (ASTM published ____), Standard Test Method for Volatility of Liquefied Petroleum (LP) Gases

PNS ASTM D 1838:2014 (ASTM published ____), Standard Test Method for Copper Strip Corrosion by Liquefied Petroleum (LP) Gases

PNS ASTM D 2163:2014e1 (ASTM published ____), Standard Test Method for Determination of Hydrocarbons in Liquefied Petroleum (LP) Gases and Propane/Propene Mixtures by Gas Chromatography

PNS ASTM D 2784:2011 (ASTM published ____), Standard Test Method for Sulfur in Liquefied Petroleum Gases (Oxy-Hydrogen Burner or Lamp)

PNS ASTM D 1265:2011 (ASTM published ____), Standard Practice for Sampling Liquefied Petroleum (LP) Gases, Manual Method

Abbreviations

PNS - Philippine National Standard

ASTM - American Society for Testing and Materials

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