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Specification for

# Commercial butane and commercial propane

ICS 75.160.30

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# Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee PTI/10, Liquefied petroleum gases, upon which the following bodies were represented:

- British Compressed Gases Association
- British Fire Services' Association
- British Gases plc
- Chemical Industries Association
- Department of Trade and Industry (Oil and Gas Division)
- Institute of Petroleum
- LP Gas Association
- Society of Motor Manufacturers and Traders Limited
- United Kingdom Petroleum Industry Association Ltd.

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## Foreword

This British Standard has been prepared by Technical Committee PTI/10. It supersedes BS 4250 : Part 1 : 1995, which is withdrawn.

BS 4250 was first published in 1968 as a specification for commercial butane and propane in response to a request from the Ministry of Defence. Revisions were published in 1975 and 1987. In the 1987 revision, the standard was divided into two Parts, Part 1: *Specification for commercial butane and propane* and Part 2: *Specification for automotive LPG*. BS 4250 : Part 2 was superseded by BS EN 589 : 1993.

The 1995 edition of the specification for commercial butane and propane introduced technical changes intended to bring the safety warnings up to date with the guidance on occupational exposure limits described in HSE Guidance Note EH40/93. The maximum limit for dienes content was reduced to 0.5 % mole and extended to apply to propane. A limit for ammonia was introduced. Guidance was given on the selection of gas chromatographic equipment for the quantitative measurement of components not described in published test methods. The attention of users of this standard was drawn to the implications of EC Directive No. 67/548/EEC [1] for the potential classification of commercial butane and commercial propane as carcinogenic substances.

The changes in this edition of BS 4250 are intended to correct a number of errors in the text of the 1995 edition and to reflect the publication of several standards which were previously 'in preparation'. Maximum values for R number and O number are now specified rather than given for guidance.

This British Standard calls for the use of substances and/or procedures that may be injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage. Attention is drawn to the safety warnings given in the introduction to this standard.

**Compliance with a British Standard does not of itself confer immunity from legal obligations.**

### Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 10, an inside back cover and a back cover.

# Specification

## Introduction

### SAFETY WARNINGS

Attention is drawn to the risk of fire and explosion when handling commercial butane or commercial propane, and to the hazard to health which arises through inhalation of excessive amounts of commercial butane or commercial propane.

Commercial butane and commercial propane are highly volatile hydrocarbon liquids which are normally stored under pressure. If the pressure is released, large volumes of gas will be produced which form flammable mixtures with air typically over the range 2 % (V/V) to 10 % (V/V). The procedures described in this British Standard involve the sampling, handling and testing of commercial butane or commercial propane. All such procedures should be conducted away from sources of ignition such as naked flames, unprotected electrical equipment and electrostatic hazards. Testing should be performed as far as practicable under an electrically-safe ventilation hood.

Commercial butane or commercial propane in liquid form can cause cold burns to the skin. Protective clothing such as gloves and goggles should be worn if contact with the skin is likely to occur.

Unnecessary inhalation of commercial butane or commercial propane vapour should be avoided. The operator should not be exposed to atmospheres containing more than 1000 ppm (1750 mg/m<sup>3</sup>) over an 8 h time-weighted average reference period (long-term exposure limit), or greater than 1250 ppm (2180 mg/m<sup>3</sup>) over a 15 min reference period (short-term exposure limit). One of the tests described in this standard involves the operator inhaling a mixture of air and commercial butane or commercial propane vapour, and particular attention is drawn to the cautionary statement in 5.3.

NOTE. These exposure limits are taken from HSE Guidance Note EH 40/97 [2], which is revised annually. The occupational exposure limits given in the latest edition should be observed.

## 1 Scope

This British Standard specifies requirements for commercial butane and commercial propane as supplied for general domestic and industrial fuel purposes. It applies to these products in cylinders and in bulk.

NOTE. The requirements apply at the point of custody transfer. Withdrawal or loss of product from the vapour phase will change the composition of the product remaining in the liquid phase. Hence the product may cease to meet specified requirements.

This standard does not cover gases for testing gas appliances, for which reference should be made to BS EN 437.

## 2 References

### 2.1 Normative references

This British Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are made at the appropriate places in the text and the cited publications are listed on the inside back cover. For dated references, only the edition cited applies; any subsequent amendments to or revisions of the cited publication apply to this British Standard only when incorporated in the reference by amendment or revision. For undated references, the latest edition of the cited publication applies, together with any amendments.

### 2.2 Informative references

This British Standard refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back cover, but reference should be made to the latest editions.

## 3 Sampling

For all test methods, sampling shall be carried out from the liquid phase in accordance with the procedures described for liquefied gases in BS 5309 : Part 1 and section 6 of BS 5309 : Part 3 : 1976. All sample containers used shall be fitted with two valves and an ullage tube.

NOTE. The method described in ASTM D 3700 [3] may be used, subject to agreement between supplier and customer.

**WARNING.** Attention is drawn to the need to observe relevant safety precautions for handling commercial butane or commercial propane during sampling operations.

## 4 Composition

### 4.1 Commercial butane

The product shall consist of a hydrocarbon mixture containing predominantly butanes and/or butenes.

### 4.2 Commercial propane

The product shall consist of a hydrocarbon mixture containing predominantly propane and/or propene.

## 5 Properties of commercial butane and commercial propane

### 5.1 General

The properties of the commercial butane and commercial propane shall be in accordance with table 1.

For gauge vapour pressure, either the direct measurement method described in BS EN ISO 4256 or the calculation procedure described in annex A of this standard shall be used. The method described in BS EN ISO 4256 is the reference method and shall be used in cases of dispute.