

Analysis of fuel gases —

Part 11: Methods for non-manufactured gases —

Section 11.2 Determination of potential hydrocarbon liquid content —

Subsection 11.2.1 General introduction

[ISO title: Natural gas — Determination of potential hydrocarbon liquid content — Part 1: Principles and general requirements]

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Environment and Pollution Standards Committee (EPC/-) to Technical Committee EPC/46, upon which the following bodies were represented:

- British Ceramic Research Association
- British Gas Corporation
- Cement Makers' Federation
- Chemical Industries Association
- Department of Energy (Gas Standards)
- Department of Trade and Industry (Electronics Application Division)
- Department of Trade and Industry (Laboratory of the Government Chemist)
- Department of Trade and Industry (Warren Spring Laboratory)
- Electricity Supply Industry in England and Wales)
- GAMBICA (BEAMA Ltd.)
- Institute of Petroleum
- Institution of Chemical Engineers
- Institution of Gas Engineers
- National Coal Board
- Society of Chemical Industry
- Society of Glass Technology
- Society of Motor Manufacturers and Traders Limited
- Water-tube Boilermakers' Association

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- British Compressed Gases Association
- British Laboratory Ware Association

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National foreword

This Subsection of BS 3156 has been prepared under the direction of the Environment and Pollution Standards Committee. It is identical with ISO 6570-1:1983 “*Natural gas — Determination of potential hydrocarbon liquid content — Part 1 : Principles and general requirements*”, published by the International Organization for Standardization (ISO). ISO 6570-1 was prepared as a result of discussions in Technical Committee 158, Gas Analysis, in which the UK has participated.

BS 3156 was first published as a single standard in 1959 under the title “*Methods for the sampling and analysis of fuel gases*”. A first revision was carried out in 1968 under the title “*Methods for the analysis of fuel gases*”, Parts 1, 2 and 3 being published in that year. Parts 4 and 5 of BS 3156 were published in 1969. This new series of BS 3156, which begins at Part 10, will incorporate methods prepared by ISO/TC 158. In addition, it is intended to revise Parts 1 to 5 and publish them in the new series.

Terminology and conventions. The text of the International Standard has been approved as suitable for publication as a British Standard without deviation. Some terminology and certain conventions are not identical with those used in British Standards; attention is drawn especially to the following. Wherever the words “International Standard” or “part of ISO 6570” appear, referring to this standard, they should be read as “Subsection of BS 3156”.

The comma has been used as a decimal marker. In British Standards it is current practice to use a full point on the baseline as the decimal marker.

Cross-references

International Standard	Corresponding British Standard
	BS 3156: <i>Analysis of fuel gases</i> Part 11 : <i>Methods for non-manufactured gases</i> Section 11.2 : <i>Determination of potential hydrocarbon liquid content</i>
ISO 6570-2:1984	Subsection 11.2.2:1986 <i>Weighing method</i> (Identical)
ISO 6570-3:1984	Subsection 11.2.3:1986 <i>Volumetric method</i> (Identical)

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

0 Introduction

Under certain conditions, higher hydrocarbons present in natural gas or similar gases may condense and the condensate formed can cause difficulties in the operation of gas transport and distribution systems.

Dew point measurements, by condensation on a mirror, may give an indication of the conditions under which condensation starts. However, these measurements give no further information about the amounts of liquid to be expected under operating conditions.

For proper operation of transport and distribution systems, a knowledge of the quantities of condensate formed as a function of temperature and pressure is required. This knowledge is also required for the design of production and treatment systems, and for subsequent handling and disposal of the liquid.

The methods described in this International Standard are intended for the determination of the quantity of hydrocarbon condensate formed from a natural gas or similar gas as function of the temperature and pressure of the gas.

The amount of condensate can be determined in two different ways: by weighing or by volumetric measurement. Both methods of determination give the same result. However, some practical differences are:

- the weighing method can be operated unattended and is therefore suitable for continuous quality control;
- the volumetric method is operated manually. In this method, the hydrocarbon liquid and water separate into two distinct phases. They can be measured separately during the same test provided that the water is present in sufficient quantity, which may be the case for untreated gases.

If using the weighing method, two tests have to be executed in parallel in order to obtain the values for water and hydrocarbon liquid content (see also 6.4).

NOTE Unless otherwise specified, gas volumes are in cubic metres at 273,15 K and 101 325 Pa.

1 Scope and field of application

This part of ISO 6570 describes the principles of, and general requirements for, methods for the determination of the potential hydrocarbon liquid content of natural gas, or similar gas, at a given pressure and temperature.

The methods themselves are described in more detail in the two other parts of this International Standard: the weighing method being specified in ISO 6570-2 and the volumetric method being specified in ISO 6570-3.

2 References

ISO 6570-2, *Natural gas — Determination of potential hydrocarbon liquid content — Part 2: Weighing method*¹⁾.

ISO 6570-3, *Natural gas — Determination of potential hydrocarbon liquid content — Part 3: Volumetric method*¹⁾.

3 Principle

Determination of the quantity of condensate which can be formed at a pressure (p) and a temperature (T) by passing a representative sample of the gas through an apparatus where it is first brought to the pressure (p) and then cooled to the temperature (T).

The temperature and pressure are selected according to the specific application (see clause 5).

Prior to reducing the pressure of the sample of gas to that required for the determination, the gas is heated, so that, after pressure reduction, the temperature is well above the dew point temperature of the gas. Downstream of the reducer, the sample is cooled isobarically in a cooling bath to the required measuring temperature.

The liquids formed are separated from the gas flow and collected, the quantity of liquid being determined by weighing or measurement of volume, and the total volume of gas being measured.

4 Sampling

In order to obtain reliable results, the conditions described below shall be observed when taking samples.

4.1 General

The gas shall, preferably, be transferred directly to the measuring installation along a pipe from the transmission line or other system. Sample cylinders may, however, be used to transport the gas to the measuring installation. Thus, both direct and indirect sampling methods may be used, but, in each case, it is imperative that the gas reaching the installation is representative of that to be tested.

¹⁾ At present at the stage of draft.