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Gas analysis — Contents of certificates for calibration gas mixtures

Analyse des gaz — Contenu des certificats des mélanges de gaz pour étalonnage

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 158, *Analysis of gases*.

This fourth edition cancels and replaces the third edition (ISO 6141:2000), which has been technically revised to align it with ISO Guide 31[3].

Gas analysis — Contents of certificates for calibration gas mixtures

1 Scope

This International Standard specifies minimum requirements for the contents of certificates for homogeneous gas mixtures in gas cylinders to be used as calibration gas mixtures. Pure gases, when used as calibration gas mixtures, are also covered by this International Standard. Gases and gas mixtures produced for other purposes are not considered.

The requirements in this International Standard deal with the metrological aspects of calibration gas mixtures. Other aspects, such as safety and legislative aspects, are not covered.

Furthermore, it specifies additional information (optional data) recommended for describing a homogeneous gas mixture, supplied under pressure in a cylinder or other container. It does not cover the field of safety-relevant data and related labelling.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC Guide 98-3, *Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

ISO 7504, *Gas analysis — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC Guide 98-3, ISO 7504, and the following apply.

3.1
producer
organization that has produced the gas or gas mixture

Note 1 to entry: The producer is the organization which bears the responsibility for the contents of the certificate.

3.2
customer
organization that has ordered the gas or gas mixture

3.3
container
vessel in which the gas or gas mixture is supplied

4 Contents

4.1 Specification of certificate data

The information specified by this International Standard shall be provided by the supplier of the gas or gas mixture, in a certificate, i.e. a document uniquely related to the container and its contents.

The certificate shall contain as a minimum the data specified as "mandatory" in Table 1. It is recommended that the data specified as "optional" are also included in the certificate.

Requirements for and explanations of the data to be provided are given in the following clauses.

Table 1 — Specification of certificate data

Mandatory data	Reference	Optional data	Reference
Title of the document	4.2.1	Customer	4.2.5
Unique certificate identification	4.2.2	Nominal composition	4.2.6
Container identification	4.2.3	Intended use	4.2.10
Producer	4.2.4	Safety information	4.2.11
Authorization date	4.2.7	Standard uncertainty	4.3.3
Responsible person	4.2.8	Method of preparation	4.3.6
Number of pages and page numbering	4.2.9	Method of analysis	4.3.8
Specified components	4.3.1	Date of preparation	4.3.9
Composition	4.3.2	Date of analysis	4.3.12
Expanded uncertainty	4.3.4	Commercial name	4.3.13
References/metrological traceability	4.3.5	Container volume	4.4.1
Filling pressure	4.3.7	Filling quantity	4.4.2
Minimum utilization pressure	4.3.10	Indicative values	4.4.5
Expiry date	4.3.11		
Valve outlet connection	4.4.3		
Storage/utilization temperature	4.4.4		

4.2 General information

4.2.1 Title of the document

The certificate shall have a title that identifies the document as a certificate stating one or more properties of a gas or gas mixture.

4.2.2 Unique certificate identification

Each certificate shall be assigned a unique identification.

4.2.3 Container identification

Containers for pressurized gases shall be identified by the number that is stamped into the wall or by batch or lot numbers.

4.2.4 Producer

Provide the name, address, telephone number and e-mail address of the producer.

4.2.5 Customer (optional)

Provide the name and address of the customer and any other information required by the customer.

NOTE ISO/IEC 17025:2005[2] requires mentioning the customer on a certificate.

4.2.6 Nominal composition (optional)

Provide the composition of the gas or gas mixture requested by the customer.

NOTE A quality indication of the gases used in preparation can be appropriate.

4.2.7 Authorization date

The date the certificate was issued shall be stated.

4.2.8 Responsible person

The signature and name of the person who is responsible for the information in the certificate shall be given.

4.2.9 Number of pages and page numbering

The total number of pages of the certificate shall be given. The pages of the document shall be numbered consecutively.

4.2.10 Intended use

State the application(s) for which the gas or gas mixture can be used.

NOTE The specification of these applications is not necessarily exhaustive.

EXAMPLE "This gas mixture can be used for calibration of equipment."

4.2.11 Safety information

Information relevant for the safe handling, transport, and storage should be provided.

NOTE This kind of information is usually given by a safety data sheet (SDS). If further information is required, this may be provided on the calibration gas or gas mixture certificate.

4.3 Gas or gas mixture specification

4.3.1 Specified components

The names of the specified components of the gas mixture shall be given in an unambiguous way that is understood by the customer. It is recommended to name the components in accordance with IUPAC terminology. For the balance gas, a more common name may be used, such as synthetic air.

4.3.2 Composition

The contents of all specified components of the gas mixture shall be given.

NOTE It is preferable to express the contents in amount-of-substance or mass fractions, since these quantities are independent of the pressure and the temperature of the gas mixture. If other quantities are used, e.g. mass concentration or volume fraction, it is necessary to specify the conditions (pressure and temperature) for which the stated composition is valid.

4.3.3 Standard uncertainty

For every specified component, it shall be possible to deduce the standard uncertainty from the uncertainty information provided.

EXAMPLE The standard uncertainty can be calculated from a stated expanded uncertainty and coverage factor.

The standard uncertainty should include the contributions from all relevant uncertainty sources. The uncertainty sources considered in the evaluation may be specified. The supplier should be ready and able to provide additional information on the evaluation of uncertainty at request of the customer.

4.3.4 Expanded uncertainty

For every specified component, the expanded uncertainty of the content shall be stated. The coverage factor used shall be specified. Preferably, the information is supplemented by the assumed probability distribution and the level of coverage.

It is recommended to use a coverage factor of 2.

4.3.5 References/metrological traceability

References shall be given, relating the stated contents and uncertainties to International Standard methods.

For the components contents specified, the metrological traceability information shall be given, including the used measurement standards or certified reference materials.

The supplier shall specify to the customer, on request, the relevant metrological traceability chains.

4.3.6 Method of preparation

Specify the essential features of the method by which the gas or gas mixture was produced.

4.3.7 Filling pressure

Provide the filling or supplied pressure of the gas or gas mixture at a specified reference temperature.

4.3.8 Method of analysis

Specify the essential features of the method by which the gas or gas mixture was analysed. This can be the analysis technique or method by which the composition was determined or by which the determined composition was validated.

4.3.9 Date of preparation

The preparation date shall be stated. To avoid ambiguity, the month shall be indicated by name and the year in four-digit notation.

4.3.10 Minimum utilization pressure

The lowest value of the pressure below which the gas or gas mixture shall no longer be sampled from the container shall be provided. Below this pressure significant deviations from the stated composition may occur.

NOTE In the case of liquefied gases, the minimum quantity of the product to be retained in the container can be specified by mass or volume instead of pressure.

4.3.11 Expiry date

The date until which the supplier guarantees that the composition of the gas mixture is stable, within the limits of expanded uncertainty shall be stated. To avoid ambiguity, the month shall be indicated by name and the year in four-digit notation.

The statement “not applicable” is taken to express that, for specific reasons, an expiry date cannot be given. If this statement is used, these reasons shall be indicated.

4.3.12 Date of analysis (optional)

If a date is specified, then the month shall be provided. To avoid ambiguity, the month shall be indicated by name and the year in four-digit notation.

4.3.13 Commercial name (optional)

A commercial name for the calibration gas or gas mixture can be provided.

4.4 Additional product information

4.4.1 Container volume

The nominal water capacity of the container shall be stated.

4.4.2 Filling quantity (optional)

The quantity of the gas or gas mixture in supplied mass, or in supplied volume should be stated. In case of a volume, the reference conditions (pressure and temperature) shall be stated.

Common reference conditions are 1,013 25 bar and 15 °C.[1]

4.4.3 Valve outlet connection

The valve outlet connection shall be specified. The specification shall be consistent with and applicable to (inter)national standards and/or regulations.

4.4.4 Storage/utilization temperature

The range of temperatures at which the gas or gas mixture shall be used or stored shall be stated.

NOTE Outside this temperature range condensation and/or reactions can cause significant deviations from the stated composition.

4.4.5 Indicative values (optional)

Provide values of contents of components that are known to be present in the gas or gas mixture, but have not been determined specifically or accurately.

NOTE The purpose of this information is raise awareness with the user regarding possible interferences when using the calibration gas mixture.