



SLOVENSKI STANDARD SIST EN ISO 6145-5:2011

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Analiza plinov - Priprava kalibracijskih plinskih zmesi z uporabo dinamičnih volumetričnih metod - 5. del: Kapilarne kalibracijske naprave (ISO 6145-5:2009)

Gas analysis - Preparation of calibration gas mixtures using dynamic volumetric methods - Part 5: Capillary calibration devices (ISO 6145-5:2009)

Gasanalyse - Herstellung von Kalibriergasgemischen mit Hilfe von dynamisch-volumetrischen Verfahren - Teil 5: Kapillardosierer (ISO 6145-5:2009)

Analyse des gaz - Préparation des mélanges de gaz pour étalonnage à l'aide de méthodes volumétriques dynamiques - Partie 5: Dispositifs d'étalonnage par capillaires (ISO 6145-5:2009)

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 6145-5

December 2010

ICS 71.040.40

English Version

**Gas analysis - Preparation of calibration gas mixtures using
dynamic volumetric methods - Part 5: Capillary calibration
devices (ISO 6145-5:2009)**

Analyse des gaz - Préparation des mélanges de gaz pour
étalonnage à l'aide de méthodes volumétriques
dynamiques - Partie 5: Dispositifs d'étalonnage par
capillaires (ISO 6145-5:2009)

Gasanalyse - Herstellung von Kalibriergasgemischen mit
Hilfe von dynamisch-volumetrischen Verfahren - Teil 5:
Kapillardosierer (ISO 6145-5:2009)

This European Standard was approved by CEN on 11 December 2010.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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Foreword

The text of ISO 6145-5:2009 has been prepared by Technical Committee ISO/TC 158 "Analysis of gases" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 6145-5:2010.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2011, and conflicting national standards shall be withdrawn at the latest by June 2011.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of ISO 6145-5:2009 has been approved by CEN as a EN ISO 6145-5:2010 without any modification.

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INTERNATIONAL STANDARD

ISO
6145-5

Second edition
2009-11-01

Gas analysis — Preparation of calibration gas mixtures using dynamic volumetric methods —

Part 5: Capillary calibration devices

iTeh STANDARD PREVIEW
*Analyse des gaz — Préparation des mélanges de gaz pour étalonnage
à l'aide de méthodes volumétriques dynamiques —
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Partie 5: Dispositifs d'étalonnage par capillaires*

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Reference number
ISO 6145-5:2009(E)

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ISO 6145-5:2009(E)

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 6145-5 was prepared by Technical Committee ISO/TC 158, *Analysis of gases*.

This second edition cancels and replaces the first edition (ISO 6145-5:2001), which has been technically revised. Some subclauses (such as Procedure and Calculations) have been detached from other closely related clauses and readability has been improved by bringing these subclauses closer together. The principle and verification parts have been clarified and separated, the uncertainty section has been checked and slightly updated and Annex A has been revised. An informative derivation of the relative combined standard uncertainty calculation has been added as Annex B.

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ISO 6145 consists of the following parts, under the general title *Gas analysis — Preparation of calibration gas mixtures using dynamic volumetric methods*:

- *Part 1: Methods of calibration*
- *Part 2: Volumetric pumps*
- *Part 4: Continuous syringe injection method*
- *Part 5: Capillary calibration devices*
- *Part 6: Critical orifices*
- *Part 7: Thermal mass-flow controllers*
- *Part 8: Diffusion method*
- *Part 9: Saturation method*
- *Part 10: Permeation method*
- *Part 11: Electrochemical generation*

ISO 6145-3, entitled *Periodic injections into a flowing gas stream*, has been withdrawn.

Gas analysis — Preparation of calibration gas mixtures using dynamic volumetric methods —

Partie 5: Capillary calibration devices

1 Scope

This part of ISO 6145 is one of a series of International Standards dealing with the various dynamic volumetric techniques used for the preparation of calibration gas mixtures. This part specifies a method for the continuous production of calibration gas mixtures from pure gases or gas mixtures using capillary calibration devices in single or multiple combinations (gas dividers).

Single capillary systems can be used to provide gas mixtures where the minor component is in the range of volume fractions from 10^{-8} to 0,5.

The relative expanded uncertainty of this technique is less than $\pm 2\%$ ($k = 2$) relative. This application is used in industrial gas mixing panels for the production of specific gas atmospheres.

Gas dividers can be used to divide gas mixtures prepared from gases or gas mixtures into controlled proportions by volume. These devices are capable of dilutions in the range of volume fractions from 0,000 5 to 0,9 of the primary gas concentration with a relative repeatability of better than 0,5 %.

Traceability of the gas mixtures produced by a gas divider is achieved by comparison of a mixture with gas mixtures related to national or international gas standards. An example is given in Annex A.

2 Normative 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 document (including any amendments) applies.

ISO 6143, *Gas analysis — Comparison methods for determining and checking the composition of calibration gas mixtures*

ISO 6145-1, *Gas analysis — Preparation of calibration gas mixtures using dynamic volumetric methods — Part 1: Methods of calibration*

3 Principle

A constant flow of gas from a capillary tube under conditions of constant pressure drop is added to a controlled flow of complementary gas. The complementary gas flow may also be derived from another capillary tube.

The appropriate capillaries are selected to give the required flows of gases into the mixing manifold. If an appropriate capillary is selected, the required flow is obtained by adjusting the pressure drop across the capillary.