SLOVENSKI STANDARD
SIST EN ISO 13443:2005

01-julij-2005

Zemeljski plin ï Standardni referenļ ni pogoji (ISO 13443:1996)

Natural gas - Standard reference conditions (ISO 13443:1996 including Corrigendum 1:1997)

Erdgas - Standardbezugsbedingungen (ISO 13443:1996)

Gaz naturel - Conditions de référence standard (ISO 13443:1996, Corrigendum 1:1997 inclus)

SIST Preview
(https://ecommerce.sist.si)
(https://ecommerce.sist.si)

Ta slovenski standard je istoveten z: EN ISO 13443:2005

SIST EN ISO 13443:2005
https://ecommerce.sist.si/catalog/standards/sist/b8566518-737f-4912-9f33-135a56508c42/sist-en-iso-13443-2005
SIST EN ISO 13443:2005
https://ecommerce.sist.si/catalog/standards/sist/b8566518-737f-4912-9f33-135a56508c42/sist-en-iso-13443-2005

ICS:

75.060	Zemeljski plin	Natural gas

SIST EN ISO 13443:2005 **en**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

SIST EN ISO 13443:2005

SIST Preview
(https://ecommerce.sist.si)

SIST EN ISO 13443:2005
https://ecommerce.sist.si/catalog/standards/sist/b8566518-737f-4912-9f33-135a56508c42/sist-en-iso-13443-2005

SIST EN ISO 13443:2005

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 13443

May 2005

ICS 75.060

English version

Natural gas - Standard reference conditions (ISO 13443:1996 including Corrigendum 1:1997)

Gaz naturel - Conditions de référence standard (ISO 13443:1996, Corrigendum 1:1997 inclus)

This European Standard was approved by CEN on 17 April 2005.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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 Central Secretariat has the same status as the official versions.

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

SIST Preview
(https://ecommerce.sist.si)
SIST EN ISO 13443:2005
https://ecommerce.sist.si/catalog/standards/sist/b8566518-737f-4912-9f33-135a56508c42/sist-en-iso-13443-2005



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

© 2005 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. EN ISO 13443:2005: E

SIST EN ISO 13443:2005

Foreword

The text of ISO 13443:1996 has been prepared by Technical Committee ISO/TC 193 "Natural gas" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 13443:2005 by CMC.

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 November 2005, and conflicting national standards shall be withdrawn at the latest by November 2005.

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

Endorsement notice

The text of ISO 13443:1996 has been approved by CEN as EN ISO 13443:2005 without any modifications.

SIST Preview
(https://ecommerce.sist.si)

SIST EN ISO 13443:2005
https://ecommerce.sist.si/catalog/standards/sist/b8566518-737f-4912-9f33-135a56508c42/sist-en-iso-13443-2005

SIST EN ISO 13443:2005

INTERNATIONAL STANDARD

ISO 13443

First edition
1996-12-15

Natural gas — Standard reference conditions

Gaz naturel — Conditions de référence standard

SIST Preview
(https://ecommerce.sist.si)
SIST Preview
(https://ecommerce.sist.si)
SIST EN ISO 13443:2005
https://ecommerce.sist.si/catalog/standards/sist/b8566518-737f-4912-9f33-135a56508c42/sist-en-iso-13443-2005
SIST EN ISO 13443:2005
https://ecommerce.sist.si/catalog/standards/sist/b8566518-737f-4912-9f33-135a56508c42/sist-en-iso-13443-2005

Reference number
ISO 13443:1996(E)

SIST EN ISO 13443:2005

Contents

		Page
	Introduction	iv
1	Scope	1
2	Normative reference	1
3	Standard reference conditions	1
Annexes		
A	Factors for conversion between reference conditions	3
B	Equations for conversion between reference conditions	5
C	Symbols	7
D	Example calculations	8
E	National usage of reference conditions	10
F	Bibliography	11

SIST Preview
(https://ecommerce.sist.si)
SIST EN ISO 13443:2005
https://ecommerce.sist.si/catalog/standards/sist/b8566518-737f-4912-9f33-135a56508c42/sist-en-iso-13443-2005

© ISO 1996

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

SIST EN ISO 13443:2005

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.

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.

SIST Preview

International Standard ISO 13443 was prepared by Technical Committee ISO/TC 193, *Natural gas*.

(https://ecommerce.sist.si)

Annexes A and C form an integral part of this International Standard. Annexes B, D, E and F are for information only.

SIST EN ISO 13443:2005
https://ecommerce.sist.si/catalog/standards/sist/b8566518-737f-4912-9f33-135a56508c42/sist-en-iso-13443-2005

SIST EN ISO 13443:2005

Introduction

The multiplicity of so-called "standard reference conditions" of temperature, pressure and humidity (state of saturation) used in the measurement of natural-gas quality and quantity can cause much confusion. Failure to take unrecognized differences of reference conditions into account can have serious consequences in, for example, custody transfer applications. Often enough, even an experienced gas engineer may not recognize the potential for error, as the units of measurement usually employ identical terminology, irrespective of differences in the reference conditions. All of the ambiguity and its undesirable consequences may easily be removed by the adoption of a single standardized set of reference conditions. The set chosen in this International Standard will be known as the ISO standard reference conditions.

SIST Preview
(https://ecommerce.sist.si)
SIST EN ISO 13443:2005
https://ecommerce.sist.si/catalog/standards/sist/b8566518-737f-4912-9f33-135a56508c42/sist-en-iso-13443-2005

SIST EN ISO 13443:2005

Natural gas — Standard reference conditions

1 Scope

This International Standard specifies the standard reference conditions of temperature, pressure and humidity to be used for measurements and calculations carried out on natural gases, natural-gas substitutes and similar fluids.

The primary application is expected to be in international custody transfer, where the reduction to a common basis of those physical attributes of a gas which describe both its quality and quantity will simplify the practice of world trade and commerce.

SIST Preview
(https://ecommerce.sist.si)

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 6976:1995, *Natural gas — Calculation of calorific values, density, relative density and Wobbe index from composition.*

3 Standard reference conditions

The standard reference (or base) conditions of temperature, pressure and humidity (state of saturation) to be used for measurements and calculations carried out on natural gases, natural-gas substitutes and similar fluids in the gaseous state are 288,15 K and 101,325 kPa for the real dry gas.

The physical properties to which these ISO standard reference conditions apply include volume, density, relative density, compression factor, superior calorific value, inferior calorific value and Wobbe index. Full definitions of these quantities are given in ISO 6976:1995. In the cases of calorific value and Wobbe index, both the volume of gas burned and the energy released by combustion shall relate to the ISO standard reference conditions.

It is recognized, however, that in certain circumstances it may be impracticable or even unallowable to use the ISO standard reference conditions. For example, national legislation or contractual obligations may demand the use of alternative reference conditions. For this reason, annex A provides factors for conversion between several sets of metric reference conditions which are known to be in regular use, and annex B gives equations which enable values of properties (relating to any other known reference conditions) to be converted to values for the ISO

SIST EN ISO 13443:2005

standard reference conditions. Annex D gives some example calculations. Annex E gives the metric reference conditions which, at present time, are believed to be those in most common usage in the countries listed.

NOTES

1 Among other considerations, the ISO standard reference conditions have been chosen to conform with those standardized in ISO 5024[1] for use in the measurement of petroleum liquids and gases.

2 288,15 K = 15 °C = 59 °F
101,325 kPa = 1,013 25 bar = 14,695 9 psia = 1 standard atmosphere (atm)

3 In ISO 6976:1995, a dry gas is defined as one for which the mole fraction of water vapour is less than 0,000 05, but this criterion is unnecessarily restrictive in the context of this International Standard, where a mole fraction of up to 0,001 may be allowable.

4 The conditions 273,15 K, 101,325 kPa and 288,15 K, 101,325 kPa are commonly referred to as "normal" and "(metric) standard" conditions, respectively, in gas-measurement practice (see IGU/G-64[4], IGU/G-73[5] and IGU/G-76[6]). This usage should not be confused with "NTP" (normal temperature and pressure) and "STP" (standard temperature and pressure), both of which conventionally refer to the former conditions. The definitions of "normal" and "standard" given in ISO 7504[2] conflict with the usage given above, and are incorrect.

5 Good practice requires that the relevant reference conditions are incorporated as part of the symbol (and *not* the unit) for the physical quantity represented wherever ambiguity is possible. For example:

— use Z(273,15 K, 101,325 kPa) or $Z(t/°C = 0, p/atm = 1)$, not Z_n, for compression factor at "normal" conditions;

— use V(273,15 K, 101,325 kPa) m^3 for the volume of gas in cubic metres at "normal" conditions, not m_n^3, $m^3(n)$, nm^3 or Nm^3, and certainly not simply m^3;

— use $V(t/°C = 15, p/kPa = 101,325)$ m^3 for the volume of gas in cubic metres at "standard" conditions, not $m^3(st)$, sm^3 or m_s^3.

Abbreviated versions such as $Z(0)$, $V(0)/m^3$ and $V(15)/m^3$, respectively, are acceptable when no misinterpretation is possible. In the latter case, $V(ISO)/m^3$ is probably the best designation.

SIST Preview
(https://ecommerce.sist.si)
SIST EN ISO 13443:2005
https://ecommerce.sist.si/catalog/standards/sist/b8566518-737f-4912-9f33-135a56508c42/sist-en-iso-13443-2005