

SLOVENSKI STANDARD oSIST prEN ISO 80000-5:2016

01-marec-2016

Veličine in enote - 5. del: Termodinamika (ISO/DIS 80000-5:2016)

Quantities and units - Part 5: Thermodynamics (ISO/DIS 80000-5:2016)

Größen und Einheiten - Teil 5: Thermodynamik (ISO/DIS 80000-5:2016)

Grandeurs et unités - Partie 5: Thermodynamique (ISO/DIS 80000-5:2016)

Ta slovenski standard je istoveten z: prEN ISO 80000-5

ICS:

SIST EN ISO 80000-5:2019

https://01.060.ls.iteh.a/Veličine in enotesist/687ecc3c-cQuantities and units/ac7697/sist-en-iso-80000-5-2019 17.200.01 Termodinamika na splošno Thermodynamics in general

oSIST prEN ISO 80000-5:2016 en,fr,de

oSIST prEN ISO 80000-5:2016

iTeh Standards (https://standards.iteh.ai) Document Preview

SIST EN ISO 80000-5:2019

https://standards.iteh.ai/catalog/standards/sist/687ecc3c-e9ae-4b4e-a1f5-805989ac7697/sist-en-iso-80000-5-2019

DRAFT INTERNATIONAL STANDARD ISO/DIS 80000-5

ISO/TC **12**

Voting begins on: **2016-01-14**

Secretariat: SIS

Voting terminates on: 2016-04-14

Quantities and units —

Part 5: **Thermodynamics**

Grandeurs et unités — Partie 5: Thermodynamique

ICS: 01.060

iTeh Standards (https://standards.iteh.ai) Document Preview

SIST EN ISO 80000-5:2019

https://standards.iteh.ai/catalog/standards/sist/687ecc3c-e9ae-4b4e-a1f5-805989ac7697/sist-en-iso-80000-5-2019

ISO/CEN PARALLEL PROCESSING

This draft has been developed within the International Organization for Standardization (ISO), and processed under the **ISO lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five month enquiry.

Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.



Reference number ISO/DIS 80000-5:2015(E)

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENT AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

iTeh Standards (https://standards.iteh.ai) Document Preview

SIST EN ISO 80000-5:2019

https://standards.iteh.ai/catalog/standards/sist/687ecc3c-e9ae-4b4e-a1f5-805989ac7697/sist-en-iso-80000-5-2019



© ISO 2015, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office Ch. de Blandonnet 8 • CP 401 CH-1214 Vernier, Geneva, Switzerland Tel. +41 22 749 01 11 Fax +41 22 749 09 47 copyright@iso.org www.iso.org

ISO/DIS 80000-5

Contents

Forewo	ord	iv
1	Scope	.1
2	Normative references	.1
3	Quantities, units and definitions	.2
Annex	A (informative) Units based on the foot, pound, second and some other related units	1
Annex	B (informative) Other non-SI units given for information, especially regarding the conversion factors	.3
Bibliog	Jraphy	.4

iTeh Standards (https://standards.iteh.ai) Document Preview

SIST EN ISO 80000-5:2019

https://standards.iteh.ai/catalog/standards/sist/687ecc3c-e9ae-4b4e-a1f5-805989ac7697/sist-en-iso-80000-5-2019

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 80000-5 was prepared by Technical Committee ISO/TC 12, Quantities and units.

This second edition cancels and replaces the first edition of ISO 80000-5:2007. The major technical changes from the previous standard are the following:

- the tables of quantities and units are arranged so that the quantities and the corresponding units are presented on the same pages;
- the normative references have been changed;

ISO 80000 consists of the following parts, under the general title Quantities and units:

ST EN ISO 80000-5:2019

https://Part 1: Generalai/catalog/standards/sist/687ecc3c-e9ae-4b4e-a1f5-805989ac7697/sist-en-iso-80000-5-2019

- Part 2: Mathematics
- Part 3: Space and time
- Part 4: Mechanics
- Part 5: Thermodynamics
- Part 7: Light and Radiation
- Part 8: Acoustics
- Part 9: Physical chemistry and molecular physics
- Part 10: Atomic and nuclear physics
- Part 11: Characteristic numbers
- Part 12: Condensed matter physics

IEC 80000 consists of the following parts (in collaboration with IEC/TC 25), under the general title Quantities and units:

- Part 6: Electromagnetism
- Part 13: Information science and technology
- Part 14: Telebiometrics related to human physiology

Quantities and units — Part 5: Thermodynamics

1 Scope

ISO 80000-5 gives names, symbols and definitions for quantities and units of thermodynamics. Where appropriate, conversion factors are also given.

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 80000-1:2006, Quantities and units - Part 1: General

ISO 80000-3:2006, Quantities and units — Part 3: Space and time

ISO 80000-4:2006, Quantities and units - Part 4: Mechanics

ISO 80000-9:2006, Quantities and units — Part 9: Physical chemistry and molecular physics

(https://standards.iteh.ai) Document Preview

SIST EN ISO 80000-5:2019

https://standards.iteh.ai/catalog/standards/sist/687ecc3c-e9ae-4b4e-a1f5-805989ac7697/sist-en-iso-80000-5-2019

3 Quantities, units and definitions

	Quantity			Unit	
Item No.	Name	Symbol	Definition	Symbol	Remarks
5-1	thermodynamic temperature	Τ, Θ	thermodynamic temperature is the quantity that is measured with a primary thermometer, examples of which are gas thermometers of different kinds, noise thermometers, or radiation thermometers	К	Differences of thermodynamic temperatures or changes may be expressed either in kelvin, symbol K, or in degrees Celsius, symbol °C (item 5-2).
			iTeh Standards		The International Temperature Scale of 1990 For the purpose of practical measurements, the
			(https://standards.it	eh.ai)	International Temperature Scale of 1990, ITS-90, was adopted by CIPM in 1989, which is a close
			Document Previe	ew	approximation to the thermodynamic temperature scale.
	https://sta	ndards.iteh.a	<u>SIST EN ISO 80000-5:2019</u> i/catalog/standards/sist/687ecc3c-e9ae-4b4e-a1f5-	805989ac7697/s	The quantities defined by this scale are denoted T_{90} and t_{90} , respectively (replacing T_{68} and t_{68} defined by the International Practical Temperature Scale of 1968, IPTS-68), where
					$\frac{t_{90}}{1^{\circ}\mathrm{C}} = \frac{T_{90}}{1\mathrm{K}} - 273,15$
					The units of T_{90} and t_{90} are the kelvin, symbol K, and the degree Celsius, symbol °C (item 5-2), respectively.
					For further information, see [1], [2].
					For ready conversion between temperatures reported on the International Temperature Scale and thermodynamic temperatures the systematic deviations can be found in [3].

ISO/DIS 80000-5

Item No.	Quantity			Unit	Duranda
	Name	Symbol	Definition	Symbol	Remarks
5-2	Celsius temperature	t,θ	temperature difference from the thermodynamic temperature of the ice point is called the Celsius temperature <i>t</i> , which is defined by the quantity equation: $t = T - T_0$	°C	The unit degree Celsius is a special name for the kelvin for use in stating values of Celsius temperature. The unit degree Celsius is by definition equal in magnitude to the Kelvin. A difference or interval of temperature may be expressed in kelvin or in degrees Celsius.
			and $T_0 := 273,15$ K.		The thermodynamic temperature T_0 is 0,01 K below the thermodynamic temperature of the triple point of water.
			(better cullator doudo it	ah ai)	The symbol °C for the degree Celsius shall be preceded by a space (see ISO 80000-1:2006).
			Document Previe	en.ai) W	Prefixes are not allowed in combination with the unit °C.
5-3.1	linear expansion coefficient	α_l	relative expansion divided by the change in temperature:	K ⁻¹	ist on iso 80000 5 2010
	https://sta	nuarus.nen.a	$\alpha_l = \frac{1}{l} \frac{da}{dT}$ where <i>l</i> is length (ISO 80000-3:2006, item 3-1.1) and <i>T</i> is thermodynamic temperature (item 5-1)	505767ac70778	181-611-180-80000-5-2017
5-3.2	cubic expansion coefficient	α_V, α, γ	$\alpha_V = \frac{1}{V} \frac{\mathrm{d}V}{\mathrm{d}T}$		Also called volumetric expansion coefficient
			where V is volume (ISO 80000-3:2006, item 3-4) and T is thermodynamic temperature (item 5-1)		
5-3.3	relative pressure coefficient	α_p	$\alpha_p = \frac{1}{p} \left(\frac{\partial p}{\partial T} \right)_V$		The subscripts in the symbols for items 5-3.3 to 5- 5.2 may be omitted when there is no risk of

ISO/DIS 80000-5

Item No.	Quantity			Unit	Domento
	Name	Symbol	Definition	Symbol	Remarks
			where p is pressure (ISO 80000-4:2006, item 4-15.1), T is thermodynamic temperature (item 5-1), and V is volume (ISO 80000-3:2006, item 3-4)		confusion.
5-4	pressure coefficient	β	change in pressure divided by the change in temperature: $\beta = \left(\frac{\partial p}{\partial T}\right)_{V}$	Pa/K m ⁻¹ kg s ⁻² K ⁻¹	For the unit Pa (pascal), see ISO 80000-4:2006, item 4-15.a.
			where p is pressure (ISO 80000-4:2006, item 4- 15.1), T is thermodynamic temperature (item 5-1), and V is volume (ISO 80000-3:2006, item 3-4)	oh ai)	
5-5.1	isothermal compressibility	μ _T	relative volume change as a response to a pressure change: $\kappa_T = -\frac{1}{V} \left(\frac{\partial V}{\partial p}\right)_T$	Pa^{-1} m kg ⁻¹ s ²	
	https://sta	ndards.iteh.a	where V is volume (ISO 80000-3:2006, item 3-4), p is pressure (ISO 80000-4:2006, item 4-15.1), T is thermodynamic temperature (item 5-1).	805989ac7697/	ist-en-iso-80000-5-2019
5-5.2	isentropic compressibility	\varkappa_S	$ \mu_S = -\frac{1}{V} \left(\frac{\partial V}{\partial p}\right)_S $		
			where V is volume (ISO 80000-3:2006, item 3-4), p is pressure (ISO 80000-4:2006, item 3-1.1), S is entropy (item 5-18).		