Hygrothermal performance of buildings - Calculation and presentation of climatic data - Part 5: Winter external design air temperatures and related wind data

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EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN ISO 15927-5:2005 sisaldab Euroopa standardi EN ISO 15927-5:2004 ingliskeelset teksti. Käesolev dokument on jõustatud 25.01.2005 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN ISO 15927-5:2005 consists of the English text of the European standard EN ISO 15927-5:2004. This document is endorsed on 25.01.2005 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: This standard specifies the definition, method of calculation and method of presentation of the climatic data to be used in determining the design heat load for space heating in buildings. These include: the winter external design air temperatures; the relevant wind speed and direction where appropriate	**Scope:** This standard specifies the definition, method of calculation and method of presentation of the climatic data to be used in determining the design heat load for space heating in buildings. These include: the winter external design air temperatures; the relevant wind speed and direction where appropriate

ICS 91.120.10, 91.120.30

Võtmesõnad: air temperatures, ambient air, buildings, climate, construction, damp-proofing, definition, definitions, heat engineering, heating, humidity, influence of climate, temperature measurement, winds, winter

EUROPEAN STANDARD
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EN ISO 15927-5

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ICS 07.060; 91.120.10

English version

Hygrothermal performance of buildings – Calculation and presentation of climatic data

Part 5: Data for design heat load for space heating (ISO 15927-5:2004)

Performance hygrothermique des bâtiments – Calcul et présentation des données climatiques – Partie 5: Données pour la charge calorifique de conception pour le chauffage des locaux (ISO 15927-5:2004)

Wärme- und feuchteschutztechnisches Verhalten von Gebäuden – Berechnung und Darstellung von Klimadaten – Teil 5: Daten zur Bestimmung der Norm-Heizlast für die Raumheizung (ISO 15927-5:2004)

This European Standard was approved by CEN on 2004-10-27.

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 Management Centre or to any CEN member.

The European Standards exist 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 Management Centre has the same status as the official versions.

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

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Foreword

International Standard

ISO 15927-5:2004 Hygrothermal performance of buildings – Calculation and presentation of climatic data – Part 5: Data for design heat load for space heating,

which was prepared by ISO/TC 163 'Thermal insulation' of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 89 'Thermal performance of buildings and building components', the Secretariat of which is held by SIS, as a European Standard.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards withdrawn, by May 2005 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard:

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

Endorsement notice

The text of the International Standard ISO 15927-5:2004 was approved by CEN as a European Standard without any modification.

Contents

Page

Introduction

The choice of design heat load for space heating is a matter of balancing user needs against cost. On the one hand, users expect a heating system to maintain the internal temperatures needed for health and comfort; on the other hand, very high heating demand arises from time to time, when a meteorological extreme occurs. It may be uneconomic to design heating systems for rare extremes, as this can lead to high capital (initial) cost and to lower operational efficiency of the system.

The practical solution is to choose an infrequent, but not extreme, climatological value as the basis for the design load. This means that from time to time heat demand will exceed the system capacity, with the result that internal temperatures will be lower than desired, or that supplementary heating will be needed (e.g. from local heaters). The methods of calculation in this part of ISO 15927 include a standard return period or frequency, which is judged to give an acceptable balance between risk of inadequate performance and cost.

The definition of winter external design temperatures also needs to reflect the interaction between buildings and their external environment. Buildings possess thermal inertia and do not respond instantly to changes in weather conditions. The time delay (or lag) before internal conditions are significantly affected varies among different types of construction and heating methods. To allow for this, winter external design temperatures, calculated according to this part of ISO 15927, can be defined over a range of periods from as short as 1 h to as long as 4 days.

The influence of wind is important, as infiltration can cause a large proportion of heat loss from buildings that are not airtight; this is especially true in climates where infrequent, low temperatures are associated with high wind speeds. This part of ISO 15927 specifies that average coincident wind speed and range of directions are determined for the conditions of the winter external design temperature.

1 Scope

This part of ISO 15927 specifies the definition, method of calculation and method of presentation of the climatic data to be used in determining the design heat load for space heating in buildings. These include

— the winter external design air temperatures;

— the relevant wind speed and direction, where appropriate.

Heat loss through the ground, which also contributes to the heat load for buildings, depends on longer-term temperature changes; methods for calculating ground heat loss are given in ISO 13370[1)].

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 6243, *Climatic data for building design — Proposed system of symbols*

World Meteorological Organization: *Guide to Meteorological Instruments and Methods of Observation, 6th Edition, WMO — No. 8, 1996*

3 Terms, definitions, symbols and units

3.1 Terms and definitions

For the purposes of this standard, the terms and definitions given in ISO 6243 and the following apply.

3.1.1
design heat load
maximum heat output required from the heating system of a building, in order to maintain required internal temperatures without supplementary heating

3.1.2
winter external design temperature
low external air temperature with a defined return period, used to determine the design heat load of a building

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1) ISO 13370, *Thermal performance of buildings — Heat transfer via the ground — Calculation methods.*