



# SLOVENSKI STANDARD SIST EN ISO 23993:2008

01-julij-2008

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## Toplotnoizolacijski proizvodi za opremo stavb in industrijske inštalacije - Določevanje projektne toplotne prevodnosti (ISO 23993:2008)

Thermal insulation products for building equipment and industrial installations -  
Determination of design thermal conductivity (ISO 23993:2008)

Wärmedämmung an betriebstechnischen Anlagen in der Industrie und der technischen  
Gebäudeausrichtung - Bestimmung der Betriebswärmeleitfähigkeit (ISO23993:2008)

Produits d'isolation thermique pour les équipements de bâtiment et des installations  
industrielles - Détermination de la conception de la conductivité thermique (ISO  
23993:2008)

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**Ta slovenski standard je istoveten z: EN ISO 23993:2008**

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### **ICS:**

27.220	Rekuperacija toplote. Toplotna izolacija	Heat recovery. Thermal insulation
91.100.60	Materiali za toplotno in zvočno izolacijo	Thermal and sound insulating materials

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EUROPEAN STANDARD  
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**EN ISO 23993**

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**Thermal insulation products for building equipment and industrial installations - Determination of design thermal conductivity (ISO 23993:2008)**

Produits isolants thermiques pour l'équipements du bâtiment et les installations industrielles - Détermination de la conductivité thermique utile (ISO 23993:2008)

Wärmedämmung an betriebstechnischen Anlagen in der Industrie und der technischen Gebäudeausrichtung - Bestimmung der Betriebswärmeleitfähigkeit (ISO 23993:2008)

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## Foreword

This document (EN ISO 23993:2008) has been prepared by Technical Committee CEN/TC 89 "Thermal performance of buildings and building components", the secretariat of which is held by SIS, in collaboration with Technical Committee ISO/TC 163 "Thermal performance and energy use in the built environment".

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of an identical text or by endorsement, at the latest by August 2008, and conflicting national standards shall be withdrawn at the latest by August 2008.

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, 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.

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**Thermal insulation products for building  
equipment and industrial installations —  
Determination of design thermal  
conductivity**

*Produits isolants thermiques pour l'équipement du bâtiment et les  
installations industrielles — Détermination de la conductivité thermique*

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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.

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 23993 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 89, *Thermal performance of buildings and building components*, in collaboration with ISO Technical Committee ISO/TC 163, *Thermal performance and energy use in the built environment*, Subcommittee SC 2, *Calculation methods*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This International Standard is one of a series of standards on methods for the design and evaluation of the thermal performance of building equipment and industrial installations.

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## Introduction

The establishment of design values for thermal conductivity for the calculation of the thermal performance of insulation systems for building equipment and industrial installations requires a consideration of various possible influences affecting the thermal properties of the insulation products employed due to the operational conditions of any individual insulation system.

Among these influences could be:

- the non-linearity of the thermal conductivity curve over the temperature range in which the insulant may be employed;
- the thickness effect;
- the effect of moisture in the insulant;
- ageing effects, beyond those already incorporated in the declared value;
- special installation effects such as single- or multi-layered installation.

In this International Standard, the conversion factors  $F$ , that need to be used in a variety of applications for a variety of insulation products, are given and the principles and general equations as well as some guidance for the establishment of design values for the calculation of the thermal performance of insulation systems are described. The conversion factors valid for commonly employed insulation products are given in annexes. They are well established in some cases and for some materials. Where experience is lacking and conversion factors cannot be established accurately, they are given in the form of an “educated estimate” so that the calculation result will be on the safe side, i.e. the calculated heat transfer will be greater than that actually occurring when the calculation has obeyed the rules of this International Standard.

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# Thermal insulation products for building equipment and industrial installations — Determination of design thermal conductivity

## 1 Scope

This International Standard gives methods to calculate design thermal conductivities from declared thermal conductivities for the calculation of the thermal performance of building equipment and industrial installations.

These methods are valid for operating temperatures from  $-200\text{ °C}$  to  $+800\text{ °C}$ .

The conversion factors, established for the different influences, are valid for the temperature ranges indicated in the relevant clauses or annexes.

## 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 7345, *Thermal insulation — Physical quantities and definitions*

ISO 8497, *Thermal insulation — Determination of steady-state thermal transmission properties of thermal insulation for circular pipes*

ISO 9053, *Acoustics — Material for acoustical applications — Determination of airflow resistance*

ISO 9229, *Thermal insulation — Vocabulary*

ISO 13787, *Thermal insulation products for building equipment and industrial installations — Determination of declared thermal conductivity*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 7345, ISO 9229 and the following apply.

### 3.1

#### **declared thermal conductivity**

value of the thermal conductivity of a material or product used for building equipment and industrial installations:

- based on measured data at reference conditions of temperature and humidity;
- given as a limit value, according to the determination method in ISO 13787;
- corresponding to a reasonable expected service lifetime under normal conditions