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Thermal performance of building components - Dynamic thermal characteristics - Calculation methods

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EESTI STANDARDI EESSÖNA**NATIONAL FOREWORD**

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Thermal performance of building components - Dynamic thermal characteristics - Calculation methods (ISO 13786:2007)

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Caractéristiques thermiques dynamiques - Méthodes de
calcul (ISO 13786:2007)

Wärmetechnisches Verhalten von Bauteilen - Dynamisch-
thermische Kenngrößen - Berechnungsverfahren (ISO
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Foreword

This document (EN ISO 13786:2007) has been prepared by Technical Committee ISO/TC 163 "Thermal performance and energy use in the built environment" in collaboration with Technical Committee CEN/TC 89 "Thermal performance of buildings and building components", the secretariat of which is held by SIS.

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of an identical text or by endorsement, at the latest by June 2008, and conflicting national standards shall be withdrawn at the latest by June 2008.

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Endorsement notice

The text of ISO 13786:2007 has been approved by CEN as a EN ISO 13786:2007 without any modification.

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Introduction

This International Standard provides the means (in part) to assess the contribution that building products and services make to energy conservation and to the overall energy performance of buildings.

The dynamic thermal characteristics of a building component describe the thermal behaviour of the component when it is subject to variable boundary conditions, i.e. variable heat flow rate or variable temperature on one or both of its boundaries. In this International Standard, only sinusoidal boundary conditions are considered: boundaries are submitted to sinusoidal variations of temperature or heat flow rate.

The properties considered are thermal admittances and thermal dynamic transfer properties, relating cyclic heat flow rate to cyclic temperature variations. Thermal admittance relates heat flow rate to temperature variations on the same side of the component. Thermal dynamic transfer properties relate physical quantities on one side of the component to those on the other side. From the aforementioned properties, it is possible to define the heat capacity of a given component which quantifies the heat storage property of that component.

The dynamic thermal characteristics defined in this International Standard can be used in product specifications of complete building components.

The dynamic thermal characteristics can also be used in the calculation of:

- the internal temperature in a room;
- the daily peak power and energy needs for heating or cooling;
- the effects of intermittent heating or cooling, etc.

Thermal performance of building components — Dynamic thermal characteristics — Calculation methods

1 Scope

This International Standard specifies the characteristics related to the dynamic thermal behaviour of a complete building component and provides methods for their calculation. It also specifies the information on building materials required for the use of the building component. Since the characteristics depend on the way materials are combined to form building components, this International Standard is not applicable to building materials or to unfinished building components.

The definitions given in this International Standard are applicable to any building component. A simplified calculation method is provided for plane components consisting of plane layers of substantially homogeneous building materials.

Annex A specifies simpler methods for the estimation of the heat capacities in some limited cases. These methods are suitable for the determination of dynamic thermal properties required for the estimation of energy use. These approximations are not appropriate, however, for product characterization.

Annex B gives the basic principle and examples of applications of the dynamic thermal characteristics defined in this International Standard.

Annex C provides information for programming the calculation method.

Annex D gives examples of calculation for a building component.

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 6946, *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

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

ISO 10211, *Thermal bridges in building construction — Heat flows and surface temperatures — Detailed calculations*