

First edition  
2012-08-01

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## **Building environment design — Design, dimensioning, installation and control of embedded radiant heating and cooling systems —**

Part 4:

### **Dimensioning and calculation of the dynamic heating and cooling capacity of Thermo Active Building Systems (TABS)**

*Conception de l'environnement des bâtiments — Conception, construction et fonctionnement des systèmes de chauffage et de refroidissement par rayonnement —*

*Partie 4: Dimensionnement et calculs relatifs au chauffage adiabatique et à la puissance frigorifique pour systèmes thermoactifs (TABS)*



Reference number  
ISO 11855-4:2012(E)

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Published in Switzerland

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## Contents

Page

Foreword .....	iv
Introduction.....	v
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions .....	1
4 Symbols and abbreviations.....	1
5 The concept of Thermally Active Surfaces (TAS).....	6
6 Calculation methods .....	11
6.1 General .....	11
6.2 Rough sizing method .....	12
6.3 Simplified sizing by diagrams.....	13
6.4 Simplified model based on finite difference method (FDM).....	19
6.4.1 Cooling system.....	20
6.4.2 Hydraulic circuit and slab.....	20
6.4.3 Room.....	22
6.4.4 Limits of the method .....	24
6.5 Dynamic building simulation programs.....	25
7 Input for computer simulations of energy performance .....	25
Annex A (informative) Simplified diagrams.....	26
Annex B (normative) Calculation method .....	31
B.1. Pipe level .....	31
B.2. Thermal nodes composing the slab and room .....	31
B.3. Calculations for the generic h-th hour .....	35
B.4 Sizing of the system.....	41
Annex C (informative) Tutorial guide for assessing the model.....	42
Annex D (informative) Computer program .....	44
Bibliography.....	52

## 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 11855-4 was prepared by Technical Committee ISO/TC 205, *Building environment design*.

ISO 11855 consists of the following parts, under the general title *Building environment design — Design, dimensioning, installation and control of embedded radiant heating and cooling systems*:

- Part 1: *Definition, symbols, and comfort criteria*
- Part 2: *Determination of the design and heating and cooling capacity*
- Part 3: *Design and dimensioning*
- Part 4: *Dimensioning and calculation of the dynamic heating and cooling capacity of Thermo Active Building Systems (TABS)*
- Part 5: *Installation*
- Part 6: *Control*

Part 1 specifies the comfort criteria which should be considered in designing embedded radiant heating and cooling systems, since the main objective of the radiant heating and cooling system is to satisfy thermal comfort of the occupants. Part 2 provides steady-state calculation methods for determination of the heating and cooling capacity. Part 3 specifies design and dimensioning methods of radiant heating and cooling systems to ensure the heating and cooling capacity. Part 4 provides a dimensioning and calculation method to design Thermo Active Building Systems (TABS) for energy-saving purposes, since radiant heating and cooling systems can reduce energy consumption and heat source size by using renewable energy. Part 5 addresses the installation process for the system to operate as intended. Part 6 shows a proper control method of the radiant heating and cooling systems to ensure the maximum performance which was intended in the design stage when the system is actually being operated in a building.

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## Introduction

The radiant heating and cooling system consists of heat emitting/absorbing, heat supply, distribution, and control systems. The ISO 11855 series deals with the embedded surface heating and cooling system that directly controls heat exchange within the space. It does not include the system equipment itself, such as heat source, distribution system and controller.

The ISO 11855 series addresses an embedded system that is integrated with the building structure. Therefore, the panel system with open air gap, which is not integrated with the building structure, is not covered by this series.

The ISO 11855 series shall be applied to systems using not only water but also other fluids or electricity as a heating or cooling medium.

The object of the ISO 11855 series is to provide criteria to effectively design embedded systems. To do this, it presents comfort criteria for the space served by embedded systems, heat output calculation, dimensioning, dynamic analysis, installation, operation, and control method of embedded systems.