



BSI Standards Publication

Building environment design — Embedded radiant heating and cooling systems

Part 5: Installation

National foreword

This British Standard is the UK implementation of EN ISO 11855-5:2021+A1:2023. It is identical to ISO 11855-5:2021+A1:2023. It supersedes BS EN ISO 11855-5:2021, which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to ISO text carry the number of the ISO amendment. For example, text altered by ISO amendment 1 is indicated by **A1** ^{A1}.

The UK participation in its preparation was entrusted to Technical Committee RHE/2, Ventilation for buildings, heating and hot water services.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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English Version

**Building environment design - Embedded radiant
heating and cooling systems - Part 5: Installation (ISO
11855-5:2021)**

Conception de l'environnement des bâtiments
- Systèmes intégrés de chauffage et de
refroidissement par rayonnement - Partie
5 : Installation (ISO 11855-5:2021)

Umweltgerechte Gebäudeplanung
- Flächenintegrierte Strahlheizungs-
und -kühlsysteme - Teil 5: Installation
(ISO 11855-5:2021)

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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

This document (EN ISO 11855-5:2021) has been prepared by Technical Committee ISO/TC 205 "Building environment design" in collaboration with Technical Committee CEN/TC 228 "Heating systems and water based cooling systems in buildings" the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by March 2022, and conflicting national standards shall be withdrawn at the latest by March 2022.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 11855-5:2015.

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Endorsement notice

The text of ISO 11855-5:2021 has been approved by CEN as EN ISO 11855-5:2021 without any modification.

European foreword to Amendment 1

This document (EN ISO 11855-5:2021/A1:2023) has been prepared by Technical Committee ISO/TC 205 "Building environment design" in collaboration with Technical Committee CEN/TC 228 "Heating systems and water based cooling systems in buildings" the secretariat of which is held by DIN.

This Amendment to the European Standard EN ISO 11855-5:2021 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2024, and conflicting national standards shall be withdrawn at the latest by May 2024.

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Endorsement notice

The text of ISO 11855-5:2021/Amd 1:2023 has been approved by CEN as EN ISO 11855-5:2021/A1:2023 without any modification.

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 205, *Building environment design*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 228, *Heating systems and water based cooling systems in buildings*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 11855-5:2012), which has been technically revised.

The main changes compared to the previous edition are as follows:

- modified [Clause 2](#) (Normative references) and the Bibliography;
- modified [Clause 4](#) (Symbols);
- added a new subclause on vapour barrier and other layers (see [5.1.2.2](#));
- modified the subclause on insulating layers, perimeter insulating strip adding a new approach and adding details for thermal resistance of insulating layer (see [5.1.2.3](#));
- added new subclauses on insulating layers for systems in new constructions (see [5.1.2.3.2](#)) and in refurbished systems (see [5.1.2.3.3](#));
- modified the subclauses on joints (see [5.1.2.8.3](#)), leak test (see [5.1.3](#)), initial heating up of the emission system (see [5.1.4](#)) and general structural preconditions (see [5.2.2](#));
- removed the subclause on maximum heating fluid flow temperatures (previously 5.2.4);
- improved wording and made editorial changes.

A list of all parts in the ISO 11855 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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 is applicable to water-based embedded surface heating and cooling systems in buildings. The ISO 11855 series is applied to systems using not only water but also other fluids or electricity as a heating or cooling medium. The ISO 11855 series is not applicable for testing of systems. The methods do not apply to heated or chilled ceiling panels or beams.

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, control method of embedded systems, and input parameters for the energy calculations.

The ISO 11855 series consists of the following parts, under the general title *Building environment design — Embedded radiant heating and cooling systems*:

- Part 1: *Definitions, symbols, and comfort criteria*
- Part 2: *Determination of the design 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 7: *Input parameters for the energy calculation*

ISO 11855-1 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. ISO 11855-2 provides steady-state calculation methods for determination of the heating and cooling capacity. ISO 11855-3 specifies design and dimensioning methods of radiant heating and cooling systems to ensure the heating and cooling capacity. ISO 11855-4 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. ISO 11855-5, this document, addresses the installation process for the system to operate as intended. ISO 11855-6 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. ISO 11855-7 presents a calculation method for input parameters to ISO 52031.