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

**Part 5:  
Installation**

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

*Partie 5: Installation*



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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 11855-5 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*<sup>1)</sup>
- *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 1 of this International Standard defines 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. In Part 2, steady-state calculation methods for determination of the heating and cooling capacity are provided. Part 3 specifies the design and dimensioning method 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, since radiant heating and cooling systems can reduce energy consumption and heat source size by using renewable energy. Part 5 describes the installation process for the system to operate as intended. Finally, Part 6 describes a proper control method for 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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1) Parts 1, 2, 3, 4 and 6 are to be published.

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

## Part 5: Installation

### 1 Scope

This part of ISO 11855 establishes guidelines on the installation of embedded radiant heating and cooling systems. It specifies uniform requirements for the design and construction of heating and cooling floors, ceiling and wall structures to ensure that the heating/cooling systems are suited to the particular application. The requirements specified by this part of ISO 11855 are applicable only to the components of the heating/cooling systems and the elements which are part of the heating/cooling surface and which are installed due to the heating/cooling systems.

This part of ISO 11855 is applicable to water-based embedded surface heating and cooling systems in residential, commercial and industrial buildings. The methods apply to systems integrated into the wall, floor or ceiling construction without any open-air gaps, but are not applicable to panel systems with open-air gaps which are not integrated into the building structure.

### 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 10508:2006, *Plastics piping systems for hot and cold water installations — Guidance for classification and design*

ISO 11855-1, *Building environment design — Design, dimensioning, installation and control of embedded radiant heating and cooling systems — Part 1: Definition, symbols, and comfort criteria*

ISO 15874 (all parts), *Plastics piping systems for hot and cold water installations — Polypropylene (PP)*

ISO 15875 (all parts), *Plastics piping systems for hot and cold water installations — Crosslinked polyethylene (PEX)*

ISO 15876 (all parts), *Plastics piping systems for hot and cold water installations — Polybutylene (PB)*

ISO 15877 (all parts), *Plastics piping systems for hot and cold water installations — Chlorinated poly(vinyl chloride) (PVC-C)*

ISO 21003-1 (all parts), *Multilayer piping systems for hot and cold water installations inside buildings*

ISO 22391 (all parts), *Plastics piping systems for hot and cold water installations — Polyethylene of raised temperature resistance (PE-RT)*

EN 1057, *Copper and copper alloys — Seamless, round copper tubes for water and gas in sanitary and heating applications*

EN 1254 (all parts), *Copper and copper alloys — Plumbing fittings*

DIN 4724, *Kunststoff-Rohrleitungssysteme für Warmwasserheizung und Heizkörperanbindung — Vernetztes Polyethylen mittlerer Dichte (PE-MDX)*