INTERNATIONAL STANDARD

ISO 18566-6

First edition
2019-08

Building environment design — Design, test methods and control of hydronic radiant heating and cooling panel systems —

Part 6: Input parameters for the energy calculation

Reference number
ISO 18566-6:2019(E)

© ISO 2019



COPYRIGHT PROTECTED DOCUMENT

© ISO 2019

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword ..... **iv**
Introduction ..... **v**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **1**
4 Symbols and subscripts **1**
4.1 Symbols 1
4.2 Subscripts 2
5 Basic formula **2**
6 Determination of input parameters for the energy efficiency of heating and cooling emission products **3**
6.1 Heating and cooling systems with more than one covering layer above the pipes (Type 1) 3
6.2 Ceiling mounted water-based radiator system (Type 2) 4
Annex A (informative) **Calculation example (Type 1)** **5**
Bibliography **6**

© ISO 2019 – All rights reserved

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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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*.

A list of all parts in the ISO 18566 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.

© ISO 2019 – All rights reserved

Introduction

The radiant heating and cooling system consists of heat emitting/absorbing, heat supply, distribution and control systems. Typical applications are low temperature radiant heating and high temperature radiant cooling. They are classified as embedded radiant heating and cooling systems and prefabricated radiant heating and cooling panel systems.

While the ISO 11855 series is for embedded radiant heating and cooling systems without an open-air gap, the ISO 18566 series is for radiant heating and cooling panel systems with an open air gap. Because the system specifications for ISO 18566 are different from those of ISO 11855, it was necessary to develop separate ISO standards regarding the design and test methods of the cooling and heating capacity and control.

ISO 18566-1 specifies the comfort criteria, technical specifications and requirements which should be considered in the manufacturing and installation of radiant heating and cooling systems. ISO 18566-2 provides the test facility and test method for heating and cooling capacity of ceiling mounted radiant panels. ISO 18566-3 specifies the design considerations and design processes of ceiling mounted radiant panels. ISO 18566-4 addresses the control of ceiling mounted radiant heating and cooling panels to ensure the maximum performance which was intended in the design stage when the system is actually being operated in a building. This document presents a determination method of input parameters for the energy efficiency of heating and cooling products in relation to ISO 52031.[1)]

ISO 18566 does not cover the panels that are embedded into the ceiling, wall or floor structure. This document is partly based on EN 14240, EN 14037 and ASNI/ASHRAE Standard 138.

1) Under preparation. Stage at the time of publication: ISO/DIS 52031:—.

© ISO 2019 – All rights reserved

Building environment design — Design, test methods and control of hydronic radiant heating and cooling panel systems —

Part 6: Input parameters for the energy calculation

1 Scope

This document establishes guidelines for the determination of input parameters for ceiling mounted radiant heating and cooling panels in relation to ISO 52031. The requirements specified by this document are applicable only to the components of the heating/cooling systems and the elements which are part of the heating/cooling panels and which are installed to provide heating and/or cooling.

This document is applicable to water-based ceiling mounted radiant heating and cooling panels in residential, commercial and industrial buildings. The methods apply to systems mounted under the ceiling with an open air gap between the panels and the ceiling.

This document also applies, as appropriate, to the use of fluids other than water as a heating or cooling medium. This document is also applicable for testing of systems. The methods do not apply to heated or chilled ceiling beams.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 18566-1, *Building environment design — Design, test methods and control of hydronic radiant heating and cooling panel systems — Part 1: Vocabulary, symbols, technical specifications and requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 18566-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 Symbols and subscripts

4.1 Symbols

NOTE Additional symbols are given in ISO 52000 (all parts).

Symbol	Quantity	Unit
$\Delta\theta_{ctr}$	temperature variation based on room control system	K
$\Delta\theta_{ctr,1}$	temperature variation based on room control system, not certified products	K

© ISO 2019 – All rights reserved