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Hygrothermal performance of buildings — Calculation and presentation of climatic data —

Part 5: Data for design heat load for space heating

*Performance hygrothermique des bâtiments — Calcul et présentation
des données climatiques —*

*Partie 5: Données pour la charge calorifique de conception pour le
chauffage des locaux*



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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.

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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 15927 was prepared by the European Committee for Standardization (CEN) in collaboration with Technical Committee ISO/TC 163, *Thermal performance and energy use in the built environment*, Subcommittee SC 2, *Calculation methods*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

ISO 15927 consists of the following parts, under the general title *Hygrothermal performance of buildings — Calculation and presentation of climatic data*:

- *Part 1: Monthly means of single meteorological elements*
- *Part 5: Data for design heat load for space heating*

The following parts are under preparation:

- *Part 4: Data for assessing the annual energy for cooling and heating systems*
- *Part 6: Accumulated temperature differences (degree days)*

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Introduction

The choice of design heat load for space heating is a matter of balancing user needs against cost. On the one hand, users expect a heating system to maintain the internal temperatures needed for health and comfort; on the other hand, very high heating demand arises from time to time, when a meteorological extreme occurs. It may be uneconomic to design heating systems for rare extremes, as this can lead to high capital (initial) cost and to lower operational efficiency of the system.

The practical solution is to choose an infrequent, but not extreme, climatological value as the basis for the design load. This means that from time to time heat demand will exceed the system capacity, with the result that internal temperatures will be lower than desired, or that supplementary heating will be needed (e.g. from local heaters). The methods of calculation in this part of ISO 15927 include a standard return period or frequency, which is judged to give an acceptable balance between risk of inadequate performance and cost.

The definition of winter external design temperatures also needs to reflect the interaction between buildings and their external environment. Buildings possess thermal inertia and do not respond instantly to changes in weather conditions. The time delay (or lag) before internal conditions are significantly affected varies among different types of construction and heating methods. To allow for this, winter external design temperatures, calculated according to this part of ISO 15927, can be defined over a range of periods from as short as 1 h to as long as 4 days.

The influence of wind is important, as infiltration can cause a large proportion of heat loss from buildings that are not airtight; this is especially true in climates where infrequent, low temperatures are associated with high wind speeds. This part of ISO 15927 specifies that average coincident wind speed and range of directions are determined for the conditions of the winter external design temperature.