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Thermal performance of buildings - In situ testing of building test structures - Part 2: Steady-state data analysis for aggregate heat loss test

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English Version

Thermal performance of buildings - In situ testing of building test structures - Part 2: Steady-state data analysis for aggregate heat loss test

Performance thermique des bâtiments - Essais in situ des structures de bâtiments d'essai - Partie 2 : Analyse des données en régime stationnaire pour l'essai de déperdition thermique globale

Wärmetechnisches Verhalten von Gebäuden - In-situ-Messung an Bauwerksprüfkörpern - Teil 2: Auswertung stationärer Daten für die Prüfung des Gesamtwärmeverlustes

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European foreword

This document (EN 17888-2:2024) has been prepared by Technical Committee CEN/TC 89 “Thermal performance of buildings and building components”, the secretariat of which is held by SIS.

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of an identical text or by endorsement, at the latest by November 2024, and conflicting national standards shall be withdrawn at the latest by November 2024.

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Introduction

EN 17888-1 describes a test methodology that enables the actual *in situ* building test structure aggregate heat loss (building heat transfer coefficient) to be quantified. This test method is termed the aggregate heat loss test method. This document principally covers numerical methods based on steady-state linear regression techniques. The results obtained using these methods are only valid under the assumption that, in first approximation, the data can be described by these mathematical and physical laws. Statistical tests to check the validity of these assumptions are therefore given. It also results in the determination of an aggregate building heat transfer coefficient for the tested building structure, along with the uncertainty associated with this coefficient. Both the aggregate building test structure heat transfer coefficient and its uncertainty can be calculated as an output of this document. The reporting format relating to the test data and the resulting analysis is also described.

This document is highly linked with EN 17888-1 to which it applies exclusively. It is also complimentary to EN 17887-1 which deals exclusively with completed buildings.

In first instance, real building co-heating tests and associated data analysis help on determining the global performance of the building that usually take advantage of free solar gains through well oriented glazing surfaces. In this case these solar gains are welcome and contribute in reducing the energy demand for heating of the building. Aggregate heat loss coefficient extracted from data analysis on such real building is then minimized by associated solar gains and may help to better understand the real energy demand of the studied building structure regarding weather conditions.

In second instance it is from interest (as example) to concentrate on aggregate thermal performance of opaque building structures, for more precisely undertake the analysis of the thermal response of the building structure linked to these same climatic patterns. For that purpose, direct solar gains through glazing surfaces are excluded of the study by testing preferatelly opaque structures. In most of the cases, in winter periods, solar gain through opaque insulated surfaces remain poor so that the energy demand for heating become mostly dependent on temperature difference between internal and external environments. Nevertheless, this also offers the opportunity to undertake *in situ* testing with the aim to evaluate efficiency of passive solar systems that would contribute to minimize the energy demand of the tested building structure.

This document describes the input data required to undertake the analysis, various statistical methods that can be used to analyse the data, the uncertainty associated with the measurements, and the reporting format.

Detailed requirements concerning the test procedure and the data recording are specified in EN 17888-1.

1 Scope

This document specifies the steady-state data analysis methods to evaluate the data from 'the aggregate heat loss test method'. These analysis methods enable the actual *in situ* aggregate heat loss (building heat transfer coefficient) to be estimated.

NOTE The aggregate heat loss method is specified in EN 17888-1:2024.

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 5479, *Statistical interpretation of data — Tests for departure from the normal distribution*

EN 17888-1:2024, *Thermal performance of buildings — In situ testing of building test structure — Part 1: Data collection for aggregate heat loss test*