KESKKONNA SOOJUSLIKUD OMADUSED. SOOJUSMUGAVUSE ANALÜÜTILINE MÄÄRAMINE JA TÕLGENDAMINE PMV JA PPD INDEKSITE ARVUTUSE JA PAIKSE SOOJUSMUGAVUSE KRITEERIUMIDE ABIL

Ergonomics of the thermal environment. Analytical determination and interpretation of thermalcomfort using calculation of the PMV and PPD indices and local thermal comfort criteria (ISO 7730:2025).

EVS • EESTI STANDARDIMIS- JA AKREDITEERIMISKESKUS
ESTONIAN CENTRE FOR STANDARDISATION AND ACCREDITATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 7730:2025 sisaldab Euroopa standardi EN ISO 7730:2025 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 7730:2025 consists of the English text of the European standard EN ISO 7730:2025.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 17.09.2025.	Date of Availability of the European standard is 17.09.2025.
Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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English Version

Ergonomics of the thermal environment - Analytical determination and interpretation of thermal comfort using calculation of the PMV and PPD indices and local thermal comfort criteria (ISO 7730:2025)

Ergonomie des ambiances thermiques - Détermination analytique et interprétation du confort thermique par le calcul des indices PMV et PPD et par des critères de confort thermique local (ISO 7730:2025)

Ergonomie der thermischen Umgebung - Analytische Bestimmung und Interpretation der thermischen Behaglichkeit durch Berechnung des PMV- und des PPD-Indexes und Kriterien der lokalen thermischen Behaglichkeit (ISO 7730:2025)

This European Standard was approved by CEN on 24 August 2025.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN ISO 7730:2025) has been prepared by Technical Committee ISO/TC 159 "Ergonomics " in collaboration with Technical Committee CEN/TC 122 “Ergonomics” 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 2026, and conflicting national standards shall be withdrawn at the latest by March 2026.

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 7730:2005.

Any feedback and questions on this document should be directed to the users’ national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Endorsement notice

The text of ISO 7730:2025 has been approved by CEN as EN ISO 7730:2025 without any modification.

Contents

Page

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 document 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 159, *Ergonomics*, Subcommittee SC 5, *Ergonomics of the physical environment*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 122, *Ergonomics*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This fourth edition cancels and replaces the third edition (ISO 7730:2005), which has been technically revised.

The main changes are as follows:

— deletion of sections of the text (long-term evaluations, adaptation and diversity);

— correction of the calculation program;

— deletion of tables for predicting predicted mean vote (PMV).

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

This document, covering the evaluation of moderate thermal environments, is one of a number of ISO documents (alongside ISO 7243, ISO 7933 and ISO 11079, all dealing with extreme environmental conditions) specifying methods for the measurement and evaluation of the moderate and extreme thermal environments to which human beings are exposed.

A human being's thermal sensation is mainly related to the thermal balance of his or her body as a whole. This balance is influenced by physical activity and clothing, as well as the environmental parameters such as air temperature, mean radiant temperature, air velocity and air humidity. When these factors have been estimated or measured, the index for thermal comfort predicted mean vote (PMV) can be calculated. See Clause 4.

The predicted percentage dissatisfied (PPD) index provides information on thermal discomfort or thermal dissatisfaction expressed as the percentage of people likely to feel too warm or too cool in a given environment. The PPD can be obtained from the PMV. See Clause 5.

Thermal discomfort can also be caused by unwanted local cooling or heating of the body. The most common local discomfort factors are radiant temperature asymmetry (cold or warm surfaces), draught (defined as a local cooling of the body caused by air movement), vertical air temperature difference and cold or warm floors. Clause 6 specifies how to predict the percentage dissatisfied owing to local discomfort parameters.

Dissatisfaction can be caused by hot or cold discomfort for the body as a whole. Comfort limits can, in this case, be expressed by the PMV and PPD indices. But thermal dissatisfaction can also be caused by local thermal discomfort parameters. Clause 7 deals with acceptable thermal environments for comfort.

Clauses 6 and 7 are based mainly on steady-state conditions. Means of evaluating non-steady-state conditions, such as transients (temperature steps), cycling temperatures or temperature ramps, are presented in Clause 8. Thermal environments in buildings or workplaces change over time and it is not always possible to keep conditions within recommended limits.

This document is intended to be used together with ISO/TR 23663. It is also intended to be used along with ISO 28803 when considering persons with special requirements, such as those with physical disabilities. Ethnic, national or geographical differences are also important, especially when considering non-conditioned spaces. Guidance is given in Clause 8 and 10 in ISO/TR 23663.

Ergonomics of the thermal environment — Analytical determination and interpretation of thermal comfort using calculation of the PMV and PPD indices and local thermal comfort criteria

1 Scope

This document specifies a method to evaluate the general thermal comfort of people in a space and the degree of discomfort (thermal dissatisfaction) of people exposed to moderate thermal environments. It defines the analytical determination and interpretation of thermal comfort using calculation of predicted mean vote (PMV) and predicted percentage of dissatisfied (PPD) and local thermal comfort criteria, giving the environmental conditions considered acceptable for general thermal comfort as well as those representing local discomfort.

It is applicable to healthy men and women exposed to indoor environments where thermal comfort is desirable, but where moderate deviations from thermal comfort occur, in the design of new environments or the assessment of existing ones.

Although developed specifically for the work environment, this document is applicable to other kinds of environment as well.

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 9920, *Ergonomics of the thermal environment — Estimation of thermal insulation and water vapour resistance of a clothing ensemble*

ISO 13731, *Ergonomics of the thermal environment — Vocabulary and symbols*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 13731 and the following apply.

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

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

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

3.1
temperature cycle
variable temperature with a given amplitude and frequency

3.2
temperature drift
passive monotonic, steady, non-cyclic change in the operative temperature of an enclosed space