Ergonomics of the thermal environment - Assessment of heat stress using the WBGT (wet bulb globe temperature) index (ISO 7243:2017)

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NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 7243:2017 sisaldab Euroopa standardi EN ISO 7243:2017 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 7243:2017 consists of the English text of the European standard EN ISO 7243:2017.
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.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 13.09.2017.	Date of Availability of the European standard is 13.09.2017.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

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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Ergonomics of the thermal environment - Assessment of heat stress using the WBGT (wet bulb globe temperature) index (ISO 7243:2017)

Ambiances chaudes - Estimation de la contrainte thermique de l'homme au travail, basée sur l'indice WBGT (température humide et de globe noir) (ISO 7243:2017)

Ergonomie der thermischen Umgebung - Ermittlung der Wärmebelastung durch den WBGT-Index (wet bulb globe temperature) (ISO 7243:2017)

This European Standard was approved by CEN on 1 July 2017.

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

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European foreword

This document (EN ISO 7243:2017) 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of an identical text or by endorsement, at the latest by March 2018, and conflicting national standards shall be withdrawn at the latest by March 2018.

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 27243:1993.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 7243:2017 has been approved by CEN as EN ISO 7243:2017 without any modification.

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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.

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).

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

For an explanation on 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 the following URL: 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*.

This third edition cancels and replaces the second edition (ISO 7243:1989), which has been technically revised and contains the following changes:

— in Annex A, for information, additional exposure limits are represented in Figure A.1, together with reference equations;

— the assessment of heat stress now includes the effects of clothing;

— the potential errors and adjustments for non-standard globe temperature sensors are described;

— a method for predicting the natural wet bulb temperature is provided.

Introduction

This International Standard provides a method for the assessment of heat stress. It is one of a series of standards intended for use in the assessment of thermal environments. These include standards for the assessment of hot, moderate and cold environments involving both the principles of assessment and their practical application.

The wet bulb globe temperature (WBGT) is a heat stress index and its value represents the thermal environment to which an individual is exposed. This index is easy to determine in most environments. It should be regarded as a screening method to establish the presence or absence of heat stress.

A method of estimating the thermal stress, based on an analysis of the heat exchange between a person and the environment, allows a more accurate estimation of stress and an analysis of the methods of protection (see ISO 7933). Such a method should be used either directly when it is desired to carry out an intensive analysis of working conditions in heat, or in addition to the method presented in this standard, which is based upon the WBGT index, when the WBGT values obtained exceed the reference values shown.

Ergonomics of the thermal environment — Assessment of heat stress using the WBGT (wet bulb globe temperature) index

1 Scope

This document presents a screening method for evaluating the heat stress to which a person is exposed and for establishing the presence or absence of heat stress.

It applies to the evaluation of the effect of heat on a person during his or her total exposure over the working day (up to 8 h).

It does not apply for very short exposures to heat.

It applies to the assessment of indoor and outdoor occupational environments as well as to other types of environment, and to male and female adults who are fit for work.

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 7933, *Ergonomics of the thermal environment — Analytical determination and interpretation of heat stress using calculation of the predicted heat strain*

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 terminological databases for use in standardization at the following addresses:

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

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

3.1
wet bulb globe temperature
WBGT
simple index of the environment that is considered along with metabolic rate to assess the potential for heat stress among those exposed to hot conditions

Note 1 to entry: The WBGT combines the measurement of two derived parameters: natural wet-bulb temperature (t_{nw}) and black globe temperature (t_g). Where the sensors are influenced by direct incident radiation from the sun (solar load), either outdoors or indoors, the weighting of the globe temperature is reduced by including air temperature (t_a).