

**Ergonomics of the thermal environment -
Medical supervision of individuals exposed
to extreme hot or cold environments**

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cold environments

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN ISO 12894:2002 sisaldab Euroopa standardi EN ISO 12894:2001 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 16.01.2002 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN ISO 12894:2002 consists of the English text of the European standard EN ISO 12894:2001.</p> <p>This document is endorsed on 16.01.2002 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p>Käsitlusala:</p> <p>This Standard provides advice to those concerned with the safety of human exposures to extreme hot or cold thermal environments. Extreme thermal environments are those which result in a high rate of heat gain or loss by body.</p>	<p>Scope:</p> <p>This Standard provides advice to those concerned with the safety of human exposures to extreme hot or cold thermal environments. Extreme thermal environments are those which result in a high rate of heat gain or loss by body.</p>
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ICS 13.100, 13.180

Võtmesõnad: environments, ergonomics, human body, medical supervision, occupational health, thermal comfort, thermal environments, workplaces

English version

Ergonomics of the thermal environment

**Medical supervision of individuals exposed to
extreme hot or cold environments**

(ISO 12894 : 2001)

Ergonomie des ambiances thermiques – Surveillance médicale des personnes exposées à la chaleur ou au froid extrêmes (ISO 12894 : 2001)

Ergonomie des Umgebungsklimas – Medizinische Überwachung von Personen, die einer extrem heißen oder kalten Umgebung ausgesetzt sind (ISO 12894 : 2001)

This European Standard was approved by CEN on 2001-06-15.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Management Centre: rue de Stassart 36, B-1050 Brussels

Foreword

International Standard

ISO 12894 : 2001 Ergonomics of the thermal environment – Medical supervision of individuals exposed to extreme hot or cold environments,

which was prepared by ISO/TC 159 'Ergonomics' of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 122 'Ergonomics', the Secretariat of which is held by DIN, as a European Standard.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards withdrawn, by December 2001 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard:

Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

Endorsement notice

The text of the International Standard ISO 12894 : 2001 was approved by CEN as a European Standard without any modification.

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Introduction

This International Standard is one of a group of standards which specify methods for measuring and evaluating hot, moderate and cold thermal environments. International Standards or Technical Reports, which describe the evaluation of hot and cold thermal environments, give advice on the acceptability of these environments for human exposure, taking account of the activity level and the effects of clothing worn. That advice is given on the basis that the individuals concerned are healthy, that is, without any medical factor which might predispose them to ill effects from the thermal environment. Furthermore, biological variability prevents the accurate prediction of the response of any particular individual to climatic extremes. For these reasons, it is necessary to provide appropriate medical supervision for individuals who are to be exposed to extreme thermal environments. This International Standard describes a method to determine the degree of medical supervision relevant to different types of exposure, in order to limit the risk of any individual suffering from ill health.

1 Scope

This International Standard provides advice to those concerned with the safety of human exposures to extreme hot or cold thermal environments. Extreme thermal environments are those which result in a high rate of heat gain or loss by the body. A precise definition of such environments cannot easily be given, as the change in body heat storage depends on clothing and activity as well as the parameters of the climatic environment. As a guide, the boundaries of extreme environments might be considered to be as follows: for hot environments, a wet bulb globe temperature of 25 °C; for cold environments an air temperature of 0 °C or below.

Extreme environments can only be tolerated for limited periods of time before a risk of ill health results. Control measures are necessary to ensure the safety of those so exposed, one of which is the provision of appropriate medical supervision prior to and during exposures.

This International Standard is intended to assist those with responsibility for such exposures to reach decisions about the appropriate level of medical supervision in different situations. This International Standard should be read and used in the context of other relevant guidance and legislation.

This guidance is applicable to laboratory and occupational exposures to extreme environments. In either case an assessment should be made of the expected thermal stress on the individual, but the detailed arrangements for medical supervision will differ. Control of occupational exposures must also satisfy national health and safety legislation.

The laboratory or climatic chamber studies for which this International Standard will be relevant include those in which people may be exposed to high or low ambient conditions or local heating or cooling. Studies may, for example, investigate physiological or psychophysical responses to the environment or the benefit of clothing or other protective equipment. Scientific investigations and demonstrations for teaching purposes are included in the scope. In some countries, such studies are subject to specific legislation and, in all cases, experimental exposures should be conducted in the context of accepted ethical criteria as detailed in relevant national and international statements (see informative annex A and the bibliography).

Extremes of environment may be only one component of the total physiological stress imposed in a study. In such cases, appropriate advice must also be obtained with regard to any medical supervision required prior to exposure to the other stressors involved, for example whole body vibration.

In some cases, ergonomic investigations are conducted in the field, for example, to document the physiological stress of particular occupations. If the overall stress of the task is increased as a result of the proposed study, this International Standard will be relevant.

This International Standard does not apply to the use of hypo or hyper thermia in the course of medical investigation or treatment.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to

investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 9886, *Evaluation of thermal strain by physiological measurements*.

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

3 Terms and definitions

For the purposes of this International Standard, the following terms and definitions apply.

3.1

independent medical officer

qualified medical practitioner identified in a study protocol as responsible for the arrangements for medical fitness assessment and health monitoring in support of a study to which this International Standard applies and who is not the principal investigator

3.2

experimenter

the member of the investigation team who is in overall control of a particular experimental session

3.3

medical fitness assessment

procedure by which the state of past and present health of an individual is reviewed to identify any possible medical predisposition to harm from exposure to extreme thermal environments

3.4

health monitoring

process in which the acute effects on the individual resulting from exposure to an extreme thermal environment are observed and interpreted by someone with appropriate training, utilizing physiological monitoring and clinical observation

NOTE The purpose is to detect any indications that an individual may no longer be adequately tolerating the exposure conditions, and therefore to prevent any serious ill health arising, if necessary by removal of the individual from the exposure.

3.5

occupational physician

qualified medical practitioner who has received appropriate training and who is responsible for the supervision of the health at work of employees in one or more enterprise

3.6

principal investigator

where more than one person is responsible for the design of a study a principal investigator should be nominated and he or she will normally be responsible for obtaining ethical approval for a study and for ensuring that adequate arrangements are made for medical supervision of the experimental subjects

NOTE In the case of multicentre studies with a centrally agreed protocol, the person organizing the study, i.e. the promoter, may be responsible for seeking ethical approval.

4 Principles of medical supervision of individuals

4.1 General

The use of the relevant International Standards, given in clause 2, for the assessment of the thermal environment, will allow exposures to be controlled in such a way that the risk of illness arising is minimized. Where body core temperature is maintained in the band 36,0 °C to 38,0 °C then serious general health effects, resulting from