PD ISO/TS 13732-2:2001
Incorporating corrigendum March 2013



BSI Standards Publication

Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces

Part 2: Human contact with surfaces at moderate temperature

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee PH/9/-/1, Ergonomics of the physical environment.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Published by BSI Standards Limited 2013.

ISBN 978 0 580 82600 9

ICS 13.180

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This Published Document was published under the authority of the Standards Policy and Strategy Committee on 28 February 2013.

Amendments/corrigenda issued since publication

Date	Text affected
31 March 2013	Correction to BS identifier

TECHNICAL SPECIFICATION

ISO/TS 13732-2

First edition
2001-03-15

Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces —

Part 2: Human contact with surfaces at moderate temperature

Ergonomie des ambiances thermiques — Méthodes d'évaluation de la réponse humaine au contact avec des surfaces —

Partie 2: Contact humain avec des surfaces à température modérée

Reference number
ISO/TS 13732-2:2001(E)

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Foreword

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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.

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An ISO/PAS or ISO/TS is reviewed every three years with a view to deciding whether it can be transformed into an International Standard.

Attention is drawn to the possibility that some of the elements of this part of ISO/TS 13732 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/TS 13732-2 was prepared by Technical Committee ISO/TC 159, *Ergonomics*, Subcommittee SC 5, *Ergonomics of the physical environment*.

ISO/TS 13732 consists of the following parts, under the general title *Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces*:

— *Part 1: Human contact with hot surfaces*

— *Part 2: Human contact with surfaces at moderate temperature*

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Introduction

Contact between bare skin and solid surfaces may cause thermal discomfort depending upon the part of the body in contact, the temperature of the material and the type of material. It may also increase the risk when handling machines, hand tools and in the home. Bare skin in contact with metal at room temperatures may cause a cold sensation, while contact with wood may feel comfortable. The sensation and discomfort felt should be taken into account when designing and constructing handrails, handles of vehicles, hand tools, floor materials in spaces where people walk with bare feet and children play on the floor. In this part of ISO/TS 13732, some fundamental ergonomic data are presented to help the prediction of thermal sensation and discomfort caused by contact with surfaces in the moderate temperature range.

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Ergonomics of the thermal environment — Methods for the assessment of human responses to contact with surfaces —

Part 2:
Human contact with surfaces at moderate temperature

1 Scope

This part of ISO/TS 13732 presents principles and methods for predicting the thermal sensation and degree of discomfort for people where parts of the body are in contact with solid surfaces at moderate surface temperatures (approximately 10 °C to 40 °C).

It deals with the thermal sensation for contacts of the hand, foot and for the sitting position on the floor.

2 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this part of ISO/TS 13732. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO/TS 13732 are encouraged to investigate the possibility of applying the most recent edition of the normative document 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.

EN 563, *Safety of machinery — Temperatures of touchable surfaces — Ergonomics data to establish temperature limit values for hot surfaces.*

3 Parameters which influence the thermal sensation by contact

It is important to take 3.1 to 3.5 into account when predicting the thermal sensation.

3.1 Skin temperature and environmental temperature

In a warm environment, a cool surface may feel comfortable; conversely, in a cool environment a warm surface may feel comfortable. Thus, the thermal sensation on making contact with a surface is influenced by the ambient temperature. The same surface may feel cool or warm depending on the temperature of the body part making contact. So, the ambient temperature and skin temperature will both influence the thermal sensation.

3.2 Body part and type of object in contact

The surface temperature for comfort depends on the type of object (floor, handle), the body part (hand, foot) and the surface material (metal, wood). The body part in contact with the object and surface material shall be known in order to predict the thermal sensation.

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