



BSI Standards Publication

Ergonomics of human-system interaction

Part 514: Guidance for the application of anthropometric data in the ISO 9241-500 series

National foreword

This Published Document is the UK implementation of ISO/TR 9241-514:2020.

The UK participation in its preparation was entrusted to Technical Committee PH/9, Applied ergonomics.

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

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2020
Published by BSI Standards Limited 2020

ISBN 978 0 539 11973 2

ICS 13.180

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 August 2020.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

**TECHNICAL
REPORT**

**ISO/TR
9241-514**

First edition
2020-08-03

**Ergonomics of human-system
interaction —**

Part 514:
**Guidance for the application of
anthropometric data in the ISO
9241-500 series**



Reference number
ISO/TR 9241-514:2020(E)



COPYRIGHT PROTECTED DOCUMENT

© ISO 2020. Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Accommodation estimates are statistical inferences based on samples drawn from the intended user population	2
4.1 Population samples.....	2
4.1.1 Samples.....	2
4.1.2 Weighting.....	2
4.2 Univariate accommodation estimates.....	2
4.3 Multivariate accommodation estimates.....	3
4.3.1 Virtual fit test (VFT).....	3
4.3.2 Principal component analysis (PCA) and boundary cases.....	4
4.3.3 Dealing with limited data.....	5
4.3.4 Estimating concurrent accommodation for two or more variables using percentile values.....	5
4.3.5 Estimating concurrent accommodation for two or more variables using percentile values.....	6
4.3.6 Z-score multipliers in addition and subtraction of percentile values.....	6
Bibliography	8

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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

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 159 *Ergonomics*, Subcommittee SC 4, *Ergonomics of human-system interaction*.

A list of all parts in the ISO 9241 series can be found on the ISO website.

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

The use of interactive systems takes place within a physical environment. The design of the physical environment is decisive with regard to the outcome of the interaction between a variety of sizes of users and the physical environment. As described in the system concept of ISO 26800, the physical environment is embedded in an organizational and a social and cultural environment.

This document deals with the physical environment in which a physically diverse user group is assigned to one or more workplaces, or spatial environments, to accomplish a task. The entirety of the spatial environments assigned to a user is called environment of use. The relevant physical attributes of the environment of use include issues such as air quality, thermal conditions, lighting, noise, spatial layout and furniture. Specifically, this document discusses concepts for the spatial layout of workplaces so that they match the physical anthropometric characteristics of the intended user population.

Ergonomics of human-system interaction —

Part 514:

Guidance for the application of anthropometric data in the ISO 9241-500 series

1 Scope

This document is intended to provide guidance in the use of anthropometric data within the ISO 9241-500 series.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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

anthropometric accommodation

percentage of individuals in the intended user population whose anthropometric measurement values are concurrently within specified values for all anthropometric variables of interest pertinent to the design of some object

3.2

multivariate accommodation

percentage of individuals in the intended user population whose anthropometric measurement values are concurrently within specified values for multiple anthropometric variables

3.3

percentile

percentage of the measurement values that are less than the given value

3.4

user population

group of people having some common environment or activity

Note 1 to entry: These groups can be as diverse as geographically defined populations or specified age groups.

3.5

univariate accommodation

percentage of individuals in the intended user population whose anthropometric measurement values are within specified values for a single anthropometric variable