

Handbook

Ergonomics— The human factor

A practical approach to work systems design

(blank page)

STANDARDS AUSTRALIA

RECONFIRMATION

OF

HB 59—1994

Ergonomics—The human factor—A practical approach to work systems design

RECONFIRMATION NOTICE

Technical Committee SF-021 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

Certain documents referenced in the publication may have been amended since the original date of publication. Users are advised to ensure that they are using the latest versions of such documents as appropriate, unless advised otherwise in this Reconfirmation Notice.

Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 26 October 2015.

The following are represented on Technical Committee SF-021:

Australasian Health Infrastructure Alliance
Australian Chamber of Commerce and Industry
Australian Medical Association
Australian Nursing and Midwifery Federation
Consumers Federation of Australia
Department of Defence (Australian Government)
Human Factors & Ergonomics Society of Australia
Medical Technology Association of Australia Ltd
Queensland Emergency Medicine Research Foundation
Royal Australasian College of Physicians
Safety Institute of Australia
Together Queensland
University of New South Wales

NOTES

Handbook

Ergonomics— The human factor

A practical approach to work systems design

First published as part of SAA MH2—1975.
Revised and redesignated in part as SAA HB59—1994.

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140

PREFACE

This Handbook has been prepared as a basic guide to the subject of ergonomics. It is not intended for use as a definitive reference source, since a number of excellent texts on the subject have already been published. However, for those who do not need to acquire a more comprehensive treatment, this handbook will prove useful.

Ergonomics is a design philosophy which studies the three-way interactions between people, the equipment they use at their workplaces, and the environment within which the people, and equipment are placed. Its object is to design both the workplace and the environment in such a way that the most efficient use is made of human capabilities, without exceeding human capacities.

To fully understand the limitations of the human body, ergonomists need to have a working knowledge of anatomy, the ability to perceive the forces at work on the body, and a knowledge of the psychological, as well as the physiological, needs of the individual within a work system.

The practitioners of ergonomics come from a wide variety of backgrounds—the sciences, engineering, medicine, and psychology. The subject forms the basis (or at least a part) of an increasing number of courses available within a number of colleges and universities across Australia, and indeed the world.

Appendix A lists the documents referred to in this Handbook together with related documents for further reading.

© Copyright — STANDARDS AUSTRALIA

Users of Standards are reminded that copyright subsists in all Standards Australia publications and software. Except where the Copyright Act allows and except where provided for below no publications or software produced by Standards Australia may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing from Standards Australia. Permission may be conditional on an appropriate royalty payment. Requests for permission and information on commercial software royalties should be directed to the head office of Standards Australia.

Standards Australia will permit up to 10 percent of the technical content pages of a Standard to be copied for use exclusively in-house by purchasers of the Standard without payment of a royalty or advice to Standards Australia.

Standards Australia will also permit the inclusion of its copyright material in computer software programs for no royalty payment provided such programs are used exclusively in-house by the creators of the programs.

Care should be taken to ensure that material used is from the current edition of the Standard and that it is updated whenever the Standard is amended or revised. The number and date of the Standard should therefore be clearly identified.

The use of material in print form or in computer software programs to be used commercially, with or without payment, or in commercial contracts is subject to the payment of a royalty. This policy may be varied by Standards Australia at any time.

CONTENTS

	<i>Page</i>
FOREWORD	5
 SECTION 1 HUMAN PHYSICAL CAPABILITIES	
ANTHROPOMETRY	6
BIOMECHANICS	13
MUSCULOSKELETAL SYSTEM	15
Skeletal system	15
Muscular system	17
Muscle energy sources	17
Static muscle fatigue	17
Dynamic muscle fatigue	18
REACH ENVELOPES	18
Static reach envelopes	18
Dynamic reach envelopes	19
Clearances	20
Strength	20
 SECTION 2 PHYSIOLOGICAL FACTORS	
DISPLAYS AND CONTROLS	22
Design of displays and controls	22
DISPLAYS	23
Analogue displays	23
Scale divisions	24
Scale design	25
Numeral height	26
Pointer position	26
Digital displays	27
Colour	27
Size of display	27
Advantages of digital displays	27
Disadvantages of digital displays	27
OTHER FORMS OF DISPLAY	28
CONTROLS	29
Continuous controls	29
Discrete controls	29
Toggle switches	29
Rocker switches	29
Rotary switches and knobs	30
Push-buttons	32
Feedback	33
Illuminated push-buttons	33
Markings on push-buttons	33
Indicator lights	35