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Basic human body measurements for technological design – Part 2: Statistical summaries of body measurements from individual ISO populations (ISO/TR 7250-2:2010)

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Dokumentet är framtaget av kommittén för Belastningsergonomi, SIS/TK 380/AG 1.

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TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

CEN ISO/TR 7250-2

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English Version

Basic human body measurements for technological design - Part 2: Statistical summaries of body measurements from individual ISO populations (ISO/TR 7250-2:2010)

Définitions des mesures de base du corps humain pour la conception technologique - Partie 2: Résumés statistiques des mesurages du corps de populations ISO individuelles (ISO/TR 7250-2:2010)

Wesentliche Maße des menschlichen Körpers für die technische Gestaltung - Teil 2: Anthropometrische Datenbanken einzelner Bevölkerungen von ISO-Mitgliedsländern (ISO/TR 7250-2:2010)

This Technical Report was approved by CEN on 3 April 2011. It has been drawn up by the Technical Committee CEN/TC 122.

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Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

The text of ISO/TR 7250-2:2010 has been prepared by Technical Committee ISO/TC 159 “Ergonomics” of the International Organization for Standardization (ISO) and has been taken over as CEN ISO/TR 7250-2:2011 by Technical Committee CEN/TC 122 “Ergonomics” the secretariat of which is held by DIN.

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Endorsement notice

The text of ISO/TR 7250-2:2010 has been approved by CEN as a CEN ISO/TR 7250-2:2011 without any modification.

Introduction

Anthropometric data used for technological design have been included in many ISO product standards. However, different review cycles make it impossible for simultaneous revision of these product standards as new anthropometric data become available. This Technical Report is intended to serve as a continually updated repository of the most current national anthropometric data. It is intended to make current and updated anthropometric data available for inclusion by reference in the various ISO product standards requiring anthropometric data.

Body dimensions of people have been increasing in many countries over the last several decades. The rate of increase differs from country to country. In the area where significant secular change is going on, statistical summaries described in this Technical Report will be outdated sooner. Therefore, it is intended that statistical summaries of human body measurements described in this Technical Report be updated as new data become available.

Basic human body measurements for technological design —

Part 2: Statistical summaries of body measurements from individual ISO populations

1 Scope

This Technical Report provides statistical summaries of body measurements together with database background information for working age people in the national populations of individual ISO member bodies. The data in this Technical Report are intended for use in conjunction with ISO standards for equipment design and safety, which require ISO 7250-1 body measurement input, wherever national specificity of design parameters is required.

NOTE 1 Users of this Technical Report who know of newly available data are encouraged to contact their ISO member bodies and the ISO TC 159/SC3 secretariat, as described in 6.2.

Body measurement data for technological design need to be reliable in terms of representing the intended population and measurement quality. To ensure the comparability of measurements, body dimensions in this Technical Report are measured according to ISO 7250-1. To ensure the reliability of statistical data, databases from which statistics are calculated adhere to ISO 15535.

This Technical Report provides body measurement data for people of working age. In order to provide practical data, the age range is not defined and the decision is left to each country, because working age differs among countries. However, the data for children under 16 years are not included.

NOTE 2 Secular change means changes in mean body dimensions of a specific group over time. The direction of change can be positive or negative.

2 Normative references

The following referenced documents are indispensable for the application 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 7250-1:2008, *Basic human body measurements for technological design — Part 1: Body measurements definitions and landmarks*

ISO 15535:2006, *General requirements for establishing anthropometric databases*

ISO 20685:—[1)], *3-D scanning methodologies for internationally compatible anthropometric databases*

1) To be published. (Revision of ISO 20685:2005.)

3 Anthropometric measurements

Measuring conditions and definitions of measurements in this Technical Report are the same as those described in ISO 7250-1. Body measurements are described in millimetres (mm) or kilograms (kg).

Body measurements obtained from 3-D systems or obtained using instruments different from those described in ISO 7250-1 are confirmed by member bodies to be sufficiently close to those produced by the traditional methods of ISO 7250-1 according to ISO 20685:—, Clause 5.

Sometimes a measurement is not performed exactly as described in ISO 7250-1, but is very similar. In such cases, the measurement may be substituted for the ISO 7250-1 measurement if its value is adequately close. To judge closeness, the method described in ISO 20685 needs to be used. The criteria for the judgment are given in Annex A.

The measured side (right or left) is described.

When measurements not described in ISO 7250-1 are also available, the number of these measurements and the reference are provided.

Age statistics are tabulated similarly and presented together with the anthropometric measurements.

4 Statistical procedures

4.1 Data editing

Before calculating statistical values, irregular values are detected and reviewed according to ISO 15535:2006, Annex F.

4.2 Statistics

In this Technical Report, the following statistics are described for each measurement: sample size, mean, standard deviation (SD), and 1st, 5th, 50th, 95th and 99th percentile values.

4.3 Population stratification

Population can be stratified by gender, age, location, occupation or education. To keep this Technical Report at a reasonable size, statistics are presented for females, males, and females and males combined, but not for other strata.

4.4 Age stratification

In order to provide practical data and to keep the Technical Report at a reasonable size, only one age group, including all working age people, is considered.

4.5 Body measurements for representative body forms

Measurements for body forms representing large, medium and small types are useful for technological design. While medium type can be represented by P50 values for all measurements, fixed percentile options are problematic for extreme body forms, such as those derived from all P5 or P95 values. When sitting height and leg length are P5, height is smaller than P5. Though such a problem is well recognized, there is no consensus on the method for obtaining measurements for body forms statistically representing the variation in a population. Considering this lack of consensus, it was decided not to present such data in this Technical Report.

5 Background information

5.1 General

Statistics of body dimensions are described together with the following information for users to judge their reliability and context.

5.2 Background of database

5.2.1 Time period of examination

Year(s) of measurement.

5.2.2 Location of examination

Name of the country and city.

5.2.3 Demographic data

For demographic data (gender, age, etc.), information on the following items is provided:

a) definition of the working age;

b) description of subjects;

c) number of subjects by gender;

d) ten-year age groups.

When more than one subgroup based on criteria other than the age and gender is involved, the percentage of each subgroup is provided, if necessary.

5.2.4 Publication on the anthropometric research

The author, publication year, title of the publication and the name of publisher are provided when the data have been published.

5.3 Representativeness of the sample

5.3.1 Sampling method

A description is given of the grounds on which the sample was judged to be representative of the intended population. These include an examination of the sampling method and may also include the comparison of height and weight in the measured sample data with those from a large sample representing the intended population. If the data need to be weighted in order to be representative, then the weighting method is described.

5.3.2 Information on secular change

When significant secular changes are going on, information on the rate of change over the last several decades is presented, when available, and appropriate references are given.