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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 23698-2023

**General requirements for 3-D scanning anthropometric
methodologies**

三维扫描人体测量方法的一般要求

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Foreword

This document is in accordance with the provisions of GB/T 1:1-2020 "Guidelines for Standardization Work Part 1: Structure and Drafting Rules for Standardization Documents" drafting: This document replaces GB/T 23698-2009 "General Requirements for Three-dimensional Scanning Anthropometry Methods", and is consistent with GB/T 23698-2009 In addition to structural adjustments and editorial changes, the main technical changes are as follows:

- Changed the normative references (see Chapter 2, Chapter 2 of the:2009 edition);
- Delete 24 terms such as "acromion point" and "anterior superior iliac spine point", and directly refer to the corresponding terms in GB/T 5703-2023 and added four terms "spherical measurement error", "spherical dispersion", "radial distance standard deviation" and "diameter measurement error" (see Chapter 3, Chapter 3 of the:2009 edition);
- Added the calculation method and example of the 95% confidence interval of the difference between the three-dimensional scanning measured value and the measured true value (see 5:4);
- Added the chapter "Surface shape measurement evaluation test procedures" (see Chapter 7);
- Added the chapter "Repeatability Evaluation Test of Marking Point Position" (see Chapter 8);
- Added the chapter "Missing Region Assessment" (see Chapter 9);
- Delete the "nipple point", "thyroid cartilage point", "shoulder end point" and "scapula

inferior angle point" in the anatomical marker points of the recommended mark (see Appendix A:2:2 of the:2009 edition);

--- Added an informative appendix "Test Ball Example" (see Appendix B);

--- Added an informative appendix "Examples of tests and reports" (see Appendix C);

--- Added an informative appendix "Mark point coordinate data obtained by superimposing 10 scans at the same time" (see Appendix D);

--- Added an informative appendix "Missing area assessment report example" (see Appendix E): This document refers to ISO 20685-1:2018 "Three-dimensional scanning method applied to the international compatible anthropometric database - Part 1: from human Evaluation procedures for extracting human body size data from volumetric 3D scanning" and ISO 20685-2:2015 "Ergonomics applied to internationally compatible human bodies Three-dimensional scanning methods for surveying databases - Part 2: Procedures for the evaluation of the repeatability of surface shapes and associated marker positions" drafted, consistent degree of non-equivalent: Please note that some contents of this document may refer to patents: The issuing agency of this document assumes no responsibility for identifying patents: This document is proposed and managed by the National Ergonomics Standardization Technical Committee (SAC/TC7): This document is drafted by: China National Institute of Standardization, Beijing Jinfa Technology Co., Ltd., Jiangsu Jitong Garment Co., Ltd., Shenzhen Wei Plastic Intelligent Technology Co., Ltd., Air Force Medical University Air Force Special Medical Center, Zhejiang Youyi Medical Devices Co., Ltd., Donghua University, Zhejiang Jiang Qiaodun Clothing Co., Ltd., and the Institute of Chemical Defense of the Academy of Military Sciences of the Chinese People's Liberation Army: The main drafters of this document: Zhang Xin, Ran Linghua, Zhao Qichao, Liu Taijie, Hu Huimin, Dong Xiaopeng, Yang Shaoyi, Guo Xiaochao, Li Weiping, Zheng Rong, Shen Yingqin, Zheng Xiaohui, Wang Rui, Zhao He, Luo Ling, Wang Zhongting, Chu Zhiwei, Yang Ronghui, Wu Haimei: The release status of previous versions of this document and the documents it replaces are as follows:

---First published as GB/T 23698-2009 in:2009;

--- This is the first revision:

1 Scope

GB/T 23698-2023 sets the general requirements for three-dimensional scanning anthropometry. Body scanners have replaced the tape measure for clothing sizing, ergonomic design and national size surveys, but a scanner does not measure a body: it measures a surface, from which a piece of software infers landmark positions and then girths, and two scanners can differ by more than the population variation they are meant to capture. The standard therefore concentrates on validation. It sets the standard values, the validation study protocol with its sample size, subject selection, analysis steps and report,

the method for estimating the required sample size, the surface shape measurement evaluation procedure using test spheres, and the landmark position repeatability evaluation test. It replaces GB/T 23698-2009 and took effect on 1 December 2023.

This document specifies the rules for the acquisition of human body shape data using a three-dimensional surface scanning system, and the use of a three-dimensional surface scanning system to measure The rules for human body size items that can be extracted from three-dimensional scanned images defined in GB/T 5703-2023; Test procedures for 3D surface scanning systems for shape data and body dimensions: This document applies to body scanners and body segment scanners (such as head scanners, hand scanners and foot scanners): this document Body scanner for body measurements in a single view: When evaluating handheld scanners, operators themselves may body error: When the target object in the evaluated system has rotation, motion artifacts may be generated, which also affect the total error: The test procedures for the repeatability assessment of marker position recognition given in this document are applicable to markers determined by anthropometry, not suitable for For marker positions automatically calculated by point cloud software: This document does not apply to devices that measure the position and/or motion of a single marker: The intended users of this document include the use of people, anthropometric data utilizing 3D scanners to create 1D and 3D anthropometric databases makers, designers and manufacturers of 3D scanners:

2 Normative references

The contents of the following documents constitute the essential provisions of this document through normative references in the text: Among them, dated references For documents, only the version corresponding to the date is applicable to this document; for undated reference documents, the latest version (including all amendments) is applicable to this document:

GB/T 5703-2023 Anthropometric basic items for technical design

3 Terms and Definitions

The following terms and definitions defined in GB/T 5703-2023 apply to this document: 3:1 three-dimensional three-dimensional;3-D The value of three two-by-two orthogonal coordinate axes is used to represent the form of space points, and the three coordinate values of X, Y, and Z can give any one in the space: The exact location of the relevant anatomical points: NOTE: Many anthropometric length values can be calculated from the coordinates of anatomically marked points: A few extra points are required when calculating girth: 3:2 3D Body Scanner 3-Dbodyscanner A software and hardware system that can generate digital data that can represent the shape of the whole or part of the human body in three-dimensional form: 3:3 3-D scanner software 3-Dscannersoftware The operating system, user interface, program, algorithm and instructions related to the 3D scanning

system: 3:4 3D scanner hardware 3-Dscannerhardware The physical components of a 3D scanner and associated computer: 3:

5 Accuracyaccuracy The degree to which a measured value deviates from the true value:

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