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Ergonomics - Evaluation of static working postures

人类工效学 静态工作姿势评估

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents" Drafting. This document is modified to adopt ISO 11226.2000 "Ergonomic Static Working Posture Assessment". Compared with ISO 11226.2000, this document has made the following structural adjustments.

---Added normative reference documents in Chapter 2;

---Chapter 3 corresponds to Chapter 2 in ISO 11226.2000;

---Chapter 4 corresponds to

3.1 in ISO 11226.2000;

---Chapter 5 corresponds to

3.2 in ISO 11226.2000;

---Chapter 6 corresponds to

3.3 in ISO 11226.2000;

---Chapter 7 corresponds to 3.4~

3.7 in ISO 11226.2000. The technical differences between this document and ISO 11226.2000 and their reasons are as follows:

---In Table A.1, change the forearm supination range of motion limit "60°" to "90°" and change the wrist extension range of motion limit to "90°" Change it to "70°" and change the knee joint flexion range limit value "40°" to "45°" to make it consistent with the physical characteristics of Chinese people. The following editorial changes have been made to this document.

--- Incorporate the contents of ISO 11226.2000/Cor1.2006 technical errata, and the outer margins of the clauses involved are marked with vertical Straight double lines () are marked. Please note that some content in this document may be subject to patents. The publisher of this document assumes no responsibility for identifying patents. This document is proposed and coordinated by the National Ergonomics Standardization Technical Committee (SAC/TC7). This document was drafted by: Northeast Normal University, China Institute of Standardization, Winning Energy Efficiency Technology (Qingdao) Co., Ltd., Beijing United University Science, Chemical Defense Research Institute of the Chinese People's Liberation Army Academy of Military Sciences, Beijing Jinfa Technology Co., Ltd., and Beijing University of Aeronautics and Astronautics. The main drafters of this document. Xu Hongqi, Zhang Xin, Hu Huimin, Chen Jian, Yang Aiping, Ran Linghua, Luo Ling, Zheng Xiaohui, Zhao Qichao, Shi Jipeng, Zhang Shouwei, Liu Taijie, Du Junmin, Liu Zhongqi.

1 Scope

GB/T 42730-2023 sets the method for evaluating static working postures, adopting ISO 11226 with modifications. A static posture is one held rather than repeated, and it is the quiet cause of most musculoskeletal complaints in assembly, inspection and laboratory work: nobody is lifting anything heavy, but a trunk inclined forward or a head turned to one side for hours loads the tissue continuously with no opportunity for recovery. The evaluation is made against angle limits and against the time the posture is held. The standard sets the assessment procedure, the methods for measuring the working posture, and the evaluation itself, taken joint by joint from the trunk and head through the shoulders, arms and lower limbs, with informative annexes on posture measurement and on the evaluation of holding time and recovery time combinations. It took effect on 1 March 2024.

This document gives corresponding ergonomic recommendations for different work tasks. This document can be used as a guide to familiarize yourself with the basic concepts of ergonomics Provide information to people involved in the design or redesign of jobs, jobs, and products, especially those familiar with work postures. This document specifies static work involving no or minimal external force, taking into account body angle and time factors. Recommended limits for posture. This document is intended to provide guidance on the assessment of some task variables to assess health risks to working populations. This document is intended for the adult working population and the recommendations will provide reasonable protection for nearly all healthy adults. About health risks Recommendations for risk and protection are primarily based on experimental studies of

musculoskeletal loading, discomfort/pain, and endurance/fatigue associated with static work postures.

2 Normative reference documents

This document has no normative references.

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 extremebody-jointposition extremebody-jointposition Move to the extreme position of the joint's range of motion. At this position, the passive structures of the joint, such as ligaments, will bear substantial mechanical loads.

3.2 FrankfurtplaneFrankfurtplane When the midsagittal plane of the head remains vertical, the standard horizontal plane formed by the two tragus points and the right infraorbital point.

Note. Frankfurt plane is related to normal vision (relaxation of extraocular muscles).

3.3 full arm supportfularmsupport The weight of the upper arm is supported by the workplace (e.g. elbow/forearm supported on workbench).

3.4 full head supportfulheadsupport The weight of the head is supported by the workplace (e.g. the head is supported on a headrest).

3.5 Full trunk support fultrunksupport The weight of the trunk is supported directly by the workplace (for example, when the trunk is tilted backward, supported by a high chair back) or indirectly (for example, when the trunk is tilted forward, the arms supported by the workplace).

3.6 holding timeholdingtime Duration of maintaining a static working posture.