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**Guidelines for ergonomics evaluation by user test for display
and control interfaces**

显控界面工效学用户测评技术指南

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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. Please note that some of the contents of this document may involve patents. The issuing organization of this

document does not assume the responsibility for identifying patents. This document is proposed and coordinated by the National Technical Committee on Ergonomics Standardization (SAC/TC7). This document was drafted by: China National Institute of Standardization, Qingdao Haigao Design and Manufacturing Co., Ltd., Guangdong Midea HVAC Equipment Co., Ltd., Zhengzhou University, Shanghai Aircraft Design and Research Institute, CRRC Qingdao Sifang Locomotive and Rolling Stock Co., Ltd., Zhongbiao Energy Efficiency Technology (Beijing) Co., Ltd., Wuxi Little Swan Electric Co., Ltd., Guangdong Midea Refrigeration Equipment Co., Ltd., Hisense Air Conditioning Co., Ltd., Guangzhou Automobile Group Co., Ltd., Qingdao Hisense Hitachi Air Conditioning System Co., Ltd., Guangdong Midea Kitchen Appliances Manufacturing Co., Ltd., Ningbo Fotile Kitchenware Co., Ltd., Hisense Home Electric Group Co., Ltd., Xiaomi Smart Home Appliances (Wuhan) Co., Ltd., Aupu Home Furnishing Co., Ltd., Anhui Xinglian Intelligent Control Technology Co., Ltd. Company, Beijing Union University, Shenzhen Donglu Technology Co., Ltd., Xi'an Qingsong Optoelectronics Technology Co., Ltd., TPV Display Technology (Xiamen) Co., Ltd. Company, Capital University of Economics and Business, SDIC Zhongbiao Quality Infrastructure Research Institute Co., Ltd., Zhongbiao Energy Efficiency Technology (Qingdao) Co., Ltd., Technology Development (Beijing) Co., Ltd. The main drafters of this document are: Hu Huimin, Zhang Xin, Ran Linghua, Wu Jian, Li Yanlong, Zhao Chaoyi, Wang Zhongting, Li Yinxia, Yang Aiping, Ge Meng, Dong Dayong, Luo Ling, Niu Wenlei, Zhang Fan, Zhao Jing, Wang Jie, Jiang Liangkui, Gao Yang, Hu Niya, Bie Qingfeng, Hua Bo, Zhang Wenqiang, Peng Shufang, Wei Weijie, Zheng Fangchun, Zhang Bin, Zhang Xinyu, Liang Tao, Jiang Nan, Lu Mingyuan, Li Yanli, Zheng Chongkai, Wen Yanbin, Huo Canjian, Jiao Xiaolong, Li Guobao, Hu Bin, Fang Zhenan, Wang Zaiwang, Wang Jingjing, Fang Liyong, Shi Qijie, Yan Kangning, Ning Gongcheng, Wang Rui, Wu Haimei, Chen Jian, Lin Kai, Dong Qiang, He Yue, Zhao He, Wei Bo, Tong Ling, Chu Junpeng, Ding Yao, Zhang Yiwen, Cai Chang, Mei Xue, Tian Hao, Xing Xuan.

With the development of my country's economy and the improvement of people's living standards, people's demands for products are undergoing qualitative changes, gradually changing from a single function to In addition to product performance quality, people are increasingly concerned about the quality of human-computer interaction during product use, that is, the quality of product The display and control interface is the bridge for users to interact with products, and its ergonomic performance will greatly affect the convenience, learnability and comfort of using products. The usability of the product is affected, especially the product with frequent human-computer interaction. Some designers tend to only focus on the advancement of technology and ignore the interaction between man and machine. The importance of interaction leads to the design of products with complicated operation steps, poor fault tolerance, low user satisfaction, etc., which makes it difficult for users to use Use, especially for the first time or infrequently, seriously affects the user experience of the product. Ergonomics evaluation is a method of determining the ergonomics level of a product. User evaluation is the most basic and commonly used method of ergonomics

evaluation. User evaluation refers to studying the activities of users when they perform specific human-computer interaction tasks in real life environments or experimental environments, and accurately This method can obtain the most realistic user experience of the product and effectively explore Find product design problems that affect user use. User evaluation is a special evaluation method. It is different from general evaluation methods in that. The main tool used for evaluation is "people" (i.e., users of the product), rather than physical instruments. The ergonomic characteristics of a product are determined by the user's behavior, feelings, and load. The user's subjective feelings are often affected by many factors, and there are also differences between people. In order to ensure the consistency of user evaluation, it is necessary to standardize it. This document aims to provide necessary systematic guidance for user evaluation of display and control interface ergonomics, so as to improve the reliability and consistency of user evaluation. Consistency can better promote the quantitative evaluation of ergonomics and improve the quality of human-computer interaction in the use of display and control interfaces. Technical Guide for User Evaluation of Ergonomics of Display and Control Interfaces

1 Scope

GB/T 44629-2024 covers testing a display and control interface with the people who will use it. Interfaces are routinely evaluated by expert review against guidelines, which catches the obvious and misses the thing that matters: what a real operator does under time pressure, with divided attention, when the display is showing something they did not expect. In control rooms, vehicle cockpits and medical equipment that gap is where use errors come from, and use errors in those settings are not usability complaints. User testing closes it, but a badly designed test is worse than none - too few participants, participants who are not representative, tasks that lead them, and outcome measures chosen after the results were seen. This document provides guidance on the basic principles of ergonomic user evaluation of display and control interfaces, on constructing the evaluation indicator system, on the procedures for carrying out the evaluation, and on selecting the participating users. Under ICS 13.180 and CCS A25, it is written for the designers of industrial, vehicle and medical interfaces, for human factors specialists, and for the bodies that assess equipment where operator error carries a safety consequence.

This document provides the basic principles of ergonomic user evaluation of display and control interfaces, the construction of evaluation index system, evaluation implementation procedures, and participating users. Guidance on selection, construction of evaluation scenarios, user performance and user load measurement, and writing of evaluation reports. This document is applicable to ergonomic evaluation of product display and control interfaces with user participation, and can be used as a reference for other ergonomic evaluations.

2 Normative references

The contents of the following documents constitute essential clauses of this document through normative references in this document. For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document.

GB/T 32265.1-2015 Usability of daily-use products Part

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 User interfaces for information display and task control during human-system interaction.

3.2 User A person who interacts with a system, product, or service.

Note. Users of systems, products or services include. system operators, personnel who use the system operation results and system technical support personnel (including those who provide maintenance and trained personnel). [Source: GB/T 18978.11-2023, 3.1.7]

3.3 User characteristicsusercharacteristics User attributes that may affect availability. [Source: GB/T 32265.1-2015, 3.20, modified]

3.4 Target usersintendedusers The intended and actual users of a system, product, or service.

3.5 actualusers People who interact directly with the product.

Note. Before a product is launched on the market, it refers to the expected user group; after a product is launched on the market, it refers to the known actual user group. [Source: GB/T 32265.1-2015, 3.1]