

ICS 13.180
CCS A 25



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

GB/T 44799-2024

**Ergonomics of human-system interaction - Ergonomics
requirements and assessment methods for electronic visual
displays**

人-系统交互工效学 电子视觉显示工效学要求及测评

(English Translation)

Issued on: October 26, 2024

Implemented on: May 1, 2025

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

Table of Contents

Preface	
Introduction	
1 Scope	
2 Normative references	
3 Terms and definitions, abbreviations	
3.1 Terms and Definitions	
3.2 Abbreviations	
4 Requirements for Electronic Visual Displays	
4.1 Guiding Principles	
4.2 Ergonomic requirements and recommendations	
4.3 Consistency	
5 Field Evaluation Methods for Electronic Visual Displays	
5.1 Assessment Preparation	
5.2 Evaluation Methods	
5.3 Other considerations	
6 Ergonomic recommendations for reducing visual fatigue caused by stereoscopic images	
6.1 Guiding Concepts	
6.2 Ergonomic Recommendations	
6.3 Recommendations on how to use ergonomics	
7 Glasses-type 3D display	
7.1 Display Technology and Guiding Principles	
7.2 Ergonomic requirements	
7.3 Optical laboratory test methods	
7.4 Analysis and compliance testing methods	
8 Ergonomic design requirements for head-up display devices	
8.1 General Principles	
8.2 Security Requirements	
8.3 Readability requirements	
8.4 Controllability requirements	
8.5 Compatibility Requirements	
8.6 Friendliness Requirements	

8.7 Other requirements	
9 Ergonomic Evaluation Methods for Head-Up Display Devices	
9.1 Evaluation Items	
9.2 Evaluation Conditions	
9.3 Evaluation Methods	
9.4 Evaluation Procedure	
9.5 Assessment Implementation and Data Processing	
9.6 Evaluation Results	
10 Ergonomics and Technical Requirements for Display and Control Interface of Human-System Interaction in Mobile Terminals	
10.1 Ergonomic Design Principles	
10.2 Design Requirements	
Appendix A (Informative) Overview of GB/T 18978 Series Standards	
Appendix B (Informative) Attractiveness or Subjective Visual Quality	
Appendix C (Informative) Basic Concepts of Visual Perception of Contrast and Brightness on Electronic Displays	
Appendix D (Informative) Virtual Display Performance Objectives	
Appendix E (Informative) Access to Electronic Displays - Selected References	
Appendix F (Informative) Factors Affecting Ergonomic Parameters of Visual Displays	
Appendix G (Informative) Interference Reflections	
Appendix H (Informative) Display Output Linearization Test Chart for 8 Different Ambient Light Reflections in Office Workplaces	
Definitions and Applications	
Appendix I (Informative) Viewing Conditions	
Appendix J (Informative) Values to be considered when assessing visual fatigue and visual discomfort	
Appendix K (Informative) Other factors to consider for stereoscopic display	
Appendix L (Informative) Example procedures for assessing suitability and compliance	
Appendix M (Informative) Measurement Procedure Matrix	
Appendix N (Informative) Technical Description of Display Technology	
Appendix O (Normative) Specific Requirements for HUDs for Civil Aircraft	
Appendix P (Normative) Specific Requirements for Automobile HUD	
Appendix Q (Informative) Ergonomic Evaluation of Civil Aircraft HUDs	
Appendix R (Informative) Ergonomic Evaluation of Automotive HUD	
Reference	

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.

Introduction

Among the various sensory information that people receive from the external environment, visual information accounts for more than 80%. Visual display and visual interaction are the key elements of human-computer interaction.

The emergence of new display technologies such as stereoscopic display, head-up display, and mobile terminals has enriched human visual perception.

The form and content of knowledge have promoted the rapid development of the information society.

In recent years, thanks to the advancement of display technology, users can easily wear glasses to view content through large-screen TVs, personal computers and other terminals.

When people view three-dimensional objects, the lateral viewing distance between the two eyes will form slightly different retinal images in the two eyes.

The brain fuses these retinal images to form a depth-related perception called "stereoscopic vision." it is not only used in the leisure field, but also widely used in business, education, medical and other application fields. Research data shows that if human Due to the characteristics of the visual system, stereoscopic images may induce adverse effects. The published ISO/IWA3.20051 gives the image an international agreement on safety issues to reduce adverse biomedical effects caused by visual image sequences.

Visual fatigue (VFSI) is one of these adverse effects.

The head-up display device realizes the superposition display of the screen and the outside scene through the head-up display technology.

The main display provides the pilot with an interactive interface with the aircraft. With the development of technology and the reduction of costs, HUD is becoming more and more popular in the aviation field.

The application field has expanded to high-speed rail, automobile and other civilian fields. Currently, more and more automobile manufacturers have provided HUD as an important device to improve driving safety.

The HUD is the interactive interface between the onboard/vehicle electronic system and the driver, and its ergonomics level plays an important role in user experience.

The impact can greatly affect the functioning of the entire electronic system.

In the era of mobile Internet, the user interaction interface has shifted from the traditional computer interface to the mobile terminal interface, and the human-computer interaction the huge changes in the way of interaction, such as the screen size and input method of mobile phones, etc. The design of the mobile client display and control interface is the key to the development of mobile client software and hardware.

The overall design of machine interaction, operation logic and beautiful interface. A good mobile client display and control design interface must be based on the target user's usage characteristics.

Based on the characteristics and needs, a reasonable design is carried out in combination with the physical characteristics of the mobile client and the application characteristics of the software.

For an overview of the entire GB/T 18978 series, see Appendix A.

Ergonomics of Human-System Interaction Ergonomic requirements and evaluation of electronic visual displays

1 Scope

This document provides the ergonomics of general electronic visual displays, stereoscopic displays, head-up displays, mobile terminals and other electronic visual display devices.

Requirements and evaluation methods, including.

--- Provides image quality requirements and guidelines for electronic visual displays. These requirements and guidelines are general (with technology, task it is presented in the form of performance specifications and recommendations (regardless of environmental requirements) and is intended to provide effective and comfortable observation conditions.

Note 1: In addition to the references in this document, Appendix E also provides some selected literature that can help solve the problems faced by people with disabilities (including visual impairments).

Low vision, degraded vision or no vision) needs of use.

--- Provides optical, geometric and visual inspection methods for evaluating electronic visual display terminals in different usage environments.

--- Provides information on how to reduce potential visual discomfort and visual fatigue when viewing stereoscopic display images under specified viewing conditions.

The stereoscopic display optical stimulation brought by the different images presented by the two eyes may cause visual fatigue and discomfort.

Comfortable.