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**NATIONAL STANDARD OF THE
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**Eyewear display - Part 20-10: Fundamental measurement
methods - Optical properties
(English Translation)**

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Table of Contents

Preface	
Introduction	
1 Scope	
2 Normative References	
3 Terms, Definitions, Abbreviations and Symbols	
3.1 Terms and Definitions	
3.3 Symbols and Units	
4 Standard Measurement Conditions	
4.1 Standard Environmental Conditions	
4.2 Power Supply	
4.3 Preheating time	
4.4 Darkroom conditions	
5 Measurement System	
5.1 Standard Coordinate System	
5.2 Measuring Equipment	
5.3 Test Pattern	
5.4 Measurement Points	
6 Optical property testing methods 9.	
6.1 General Rules	
6.2 Preparation	
6.3 Brightness and Brightness Uniformity (Non-uniformity)	
6.4 Chromaticity and Color Gamut	
6.5 Color uniformity	
6.6 Contrast Ratio	
6.7 Field of View (FOV)	
6.9 Pixel angular density	
Appendix A (Informative) Eye Point Estimation	
A.1 Overview	
A.2 Eyepoint Measurement Based on Full Field Luminosity	
A.3 Eyepoint Measurement Based on Michelson Contrast	
Appendix B (Informative) Explanation of Measurement Results	
B.1 Geographic Coordinate Map	

B.2 Field of view

Reference

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 Part 20-10 of GB/T 48075 "Eye-Wearing Displays". GB/T 48075 has already published the following parts.

--Part 20-10.Basic Test Methods for Optical Performance;

--Part 20-20.Basic Test Methods for Image Quality;

--Part 22-10.Optical performance of AR special test methods this document is equivalent to IEC 63145-20-10:2019 "Eye-worn displays - Part 20-10.Basic test methods - Optical performance".

The following minimal editorial changes have been made to this document.

- a) The full English name of "CCD" in 3.2 is corrected to "charge-coupled device" to ensure consistency of the abbreviation;
- b) Add positive and negative signs to the arrows in Figure 1 to indicate the positive and negative angle directions, which facilitates the representation of data;
- c) Add "Note 2.For multiple point measurements, the measurement methods and calculation formulas described below in this document use 9-point measurements as an example." to section 5.4.
- d) Add "%" to formula (5) to make it easier to understand and express the completeness;
- e) According to the principle of consistency of the equal sign in the formula, " Δv " in formula (6) should be corrected to " $\Delta v(i,j)$ ";
- f) Based on the context, " $(\Delta v)_{\max}$ " in 6.5.3 and 6.5.4 should be corrected to " $[\Delta v(i,j)]_{\max}$ ";
- g) In 6.8.2 g), D_{y1} is corrected to D_{y11} , and (D_{y2}, D_{x1}, D_{x2}) in h) is corrected to $(D_{y12}, D_{x11}, D_{x12})$.
- h) 6.8.2 j) is corrected to (D_{y2}, D_{x1}, D_{x2}) as " $D_{y1}, D_{y2}, D_{x1}, D_{x2}$ " is missing from the context.

Please note that some content in this document may involve patents. The issuing

organization of this document assumes no responsibility for identifying patents.

This document was proposed by the Ministry of Industry and Information Technology of the People's Republic of China.

This document is under the jurisdiction of the National Technical Committee on Standardization of Electronic Display Devices (SAC/TC 547).

Introduction

To meet the needs of my country's manufacturing, inspection, and import/export trade of eye-wearing display products, a series of standards for eye-wearing displays have been formulated.

GB/T 48075 "Eye-Wearing Displays" is proposed to consist of the following parts.

--Part 1-2.Terminology. The purpose is to define eye-worn displays such as augmented reality, virtual reality, and mixed reality, and their image or video rendering...

A term related to dyeing.

--Part 20-10.Basic Test Methods for Optical Performance. The aim is to describe the standard measurement conditions and...

Measurement methods.

--Part 20-20.Basic Test Methods for Image Quality. The aim is to describe the standard measurement conditions for image quality in eye-worn displays and...

Measurement methods.

--Part 21-20.Special Test Methods for VR Image Quality - Screen Door Effect. The aim is to describe standard measurement criteria for the screen door effect.

--Part 22-10.Optical Performance of AR-Specific Test Methods. The aim is to describe the optical performance of (optical) see-through augmented reality eye-worn displays.

Standard measurement conditions and methods for the optical characteristics and imaging quality of displays.

--Part 22-20.AR-Specific Test Methods for Image Quality. The aim is to describe the standards for image quality in augmented reality eye-wear displays.

Preliminary measurement conditions and methods.

Eye-worn display

Part 20-10.Basic Testing Methods Optical performance

1 Scope

This document describes the standard measurement conditions and methods for the optical performance of eye-worn displays.

This document applies to both non-see-through (virtual reality "VR" glasses) and see-through (augmented reality "AR" glasses) devices that use virtual optical maps.

Like an eye-worn monitor.

This document does not apply to contact lens-type eye-wear displays and direct retinal projection eye-wear displays.

2 Normative references

This document has no normative references.

3.1 Terms and Definitions

The following terms and definitions apply to this document.

The URLs for the terminology databases maintained by ISO and IEC for standardization are as follows.

LMD entrance pupil of the LMD the optical image of the actual aperture stop as seen from the front of the LMD imaging lens system.

Note: If there is no lens in front of the aperture stop, the position and size of the entrance pupil are the same as the position and size of the aperture stop.

3.1.2

eyebow

Qualified viewing space Users can see the entire virtual image normally without moving their heads or making any other adjustments (except for natural eye movements).

The three-dimensional space in which the eye resides.

Note: "Can be seen normally" means that the displayed image meets all the requirements specified in the product specification.

3.1.3

eye point

The eye entry pupil position is set to achieve optimal performance for use with eye-worn displays and serves as the origin of the measurement coordinate system.

Note: See Appendix A for an example of estimating the eye point.