

ICS 37.020
CCS N 31



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

GB/T 45410.2-2025

**Optics and photonics - Test methods for telescopic systems -
Part 2: Binoculars**

光学和光子学 望远镜系统试验方法 第2部分：双筒望远镜

(English Translation)

Issued on: March 28, 2025

Implemented on: October 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
4 Biaxial parallelism test method
5 Exit pupil center distance test method
6 Rate difference test method
7 Focus difference test method
8 Test Report

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 is part 2 of GB/T 45410 Test methods for optical and photonic telescope systems.

The following parts are published.

--- Part 1: Basic characteristics;

--- Part 2: Binoculars;

--- Part 3: Aiming the telescope.

This document is modified from ISO 14490-2:2005 "Optics and optical instruments - Test methods for telescope systems - Part 2: Binocular telescopes Mirror test method.

The technical differences between this document and ISO 14490-2:2005 and their reasons are as follows.

--- Changed the "Scope" content (see Chapter 1) to meet the use of Chinese standards;

--- The normative reference GB/T 44403 replaces ISO 14132-1 and ISO 14132-2 (see Chapter 3) to meet the requirements of my country's standards.

Use of the standard;

--- The normative reference GB/T 45410.1-2025 replaces ISO 14490-1:2005 (see 6.1) to meet the requirements of my country's standards use;

--- Added the test result calculation method (see 4.4.1) to meet the use of Chinese standards;

--- Added Figure 2 (see 7.2) to meet the use of Chinese standards.

The following editorial changes were made to this document.

--- Change the name of the standard to "Optical and photonic telescope systems test methods Part 2: Binoculars";

--- Added the content of "Note" (see Figure 1 in 4.2.1).

Introduction

The telescope system is the core part of various telescopes and is widely used in astronomical observation, space remote sensing, geodesy, weapons and equipment, culture and education, etc.

Sports, culture, entertainment, tourism and other fields. With the advancement of science and technology and the development of social economy, the application scope of telescopes is expanding.

The industry has taken shape as the output of products has gradually increased.

With the rapid development of binocular technology at home and abroad, the test methods and test report information of binoculars have become more and more popular.

Accuracy is related to the formulation of binoculars standards, preparation of technical documents, compilation of teaching materials and books, design, manufacturing and quality evaluation.

The uniformity and correctness of the technical language in the specification have a significant impact on the development and unified description of binoculars products.

In view of the above reasons, according to the technical and usage characteristics of binoculars, the test methods and test report information table of binoculars it is very necessary to standardize and normalize it.

GB/T 45410 "Test methods for optical and photonic telescope systems" is intended to consist of ten parts.

--- Part 1: Basic characteristics. The purpose is to specify the test methods for the technical parameters of telescope systems.

--- Part 2: Binoculars. The purpose is to specify the test methods for the technical parameters of binocular systems.

--- Part 3: Aiming telescope. The purpose is to specify the test methods for the technical parameters of the aiming telescope system.

--- Part 4: Astronomical telescopes. The purpose is to specify the test methods for the technical parameters of astronomical telescope systems.

--- Part 5: Transmittance. The purpose is to specify the test methods for the technical parameters of telescope systems.

--- Part 6: Obscuration glare index. The purpose is to specify the test method for the technical parameters of the telescope system.

--- Part 7: Limiting resolution. The purpose is to specify the test method for the technical parameters of the telescope system.

--- Part 8: Night vision devices. The purpose is to specify the test methods for the technical parameters of night vision device systems.

--- Part 9: Field curvature. The purpose is to specify the test methods for the technical parameters of telescope systems.

--- Part 10: Axial color performance. The purpose is to specify the test method for the technical parameters of telescope systems.

Optics and Photonics Telescope System Experimental Methods Part 2: Binoculars

1 Scope

This document describes the test methods for the parallelism of the two axes, the center distance of the pupil, the magnification difference and the focus difference of binoculars.

This document applies to binoculars of the telescope system.

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 44403 Optics and photonics - General terminology for telescope systems and binoculars, telescopes, observation mirrors and collimators Telescope Terminology (GB/T 44403-2024, ISO 14132-1:2015, ISO 14132-2:2015, ISO 14132-3:2021, MOD) GB/T 45410.1-2025 Test methods for optical and photonic instruments telescope systems Part 1: Basic characteristics (ISO 14490-1:2005,MOD)

3 Terms and definitions

The terms and definitions defined in GB/T 44403 apply to this document.

4.1 General

The optical axes of binoculars should be parallel to ensure normal binocular vision. The degree of acceptance of the parallelism of the optical axes of binoculars depends on the person.

Physiological properties of the eye.

The measurement of biaxial parallelism should be carried out at the following pupil distances.

---60mm;

---65mm;

---70mm.

4.2 Test apparatus

4.2.1

The test arrangement for measuring the parallelism of two axes is shown in Figure 1.

4.2.2

The optical axes of the collimator and the measuring telescope should be parallel, with the deviation not exceeding 20".

If the collimator lens aperture is greater than 160mm, binoculars can share one collimator.