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

GB/T 28504.4-2025

**Rare earth doped optical fibre - Part 4: Characteristics of
erbium-doped optical fibre**

掺稀土光纤 第4部分：掺铒光纤特性

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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 Part 4 of GB/T 28504 "Rare Earth Doped Optical Fibers". GB/T 28504 has already published the following parts.

1.Characteristics of Double-Clad Ytterbium-Doped Optical Fibers;

2.Characteristics of Double-Clad Thulium-Doped Optical Fibers;

3.Characteristics of Double-Clad Erbium-Ytterbium Co-doped Optical Fibers;

4.Characteristics of Erbium-Doped Fibers 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 and is under the jurisdiction of the Ministry of Industry and Information Technology of the People's Republic of China. This document was drafted by: the PLA Navy Factory No. 701, China Information and Communication Technology Group Corporation, and China Electronics Corporation. The Eleventh Research Institute of the Science and Technology Group Corporation. The main drafters of this document are. Li Jinzhong, Xiao Wenjie, Luo Wenyong, Du Cheng, and Han

Long.

Erbium-doped fiber amplifiers (EDFAs) possess characteristics such as high gain, wide bandwidth, low noise, high efficiency, low connection loss, and polarization insensitivity, and were widely used in the 20th century. It experienced rapid development in the early 1990s, becoming the main direction of research and development in optical amplifiers at that time, and greatly promoting the development of optical fiber communication technology. The development of erbium-doped optical fibers, which are essential components of fiber optics, has also led to significant advancements. This document outlines the development of terminal fiber amplifiers, fiber lasers, and spontaneously emitted light. The standardization of erbium-doped fiber usage, production, procurement, application, and testing in light sources promotes the healthy and rapid development of the erbium-doped fiber market. Rapid development has further improved the standardization and normalization of my country's optical fiber and cable products, and promoted the development of optical fiber and cable and related optical device technologies and products. International exchanges and trade. GB/T 28504 aims to meet the development and industry standard needs of rare earth-doped optical fiber technology and is proposed to consist of four parts.

- 1.Characteristics of Double-Clad Ytterbium-Doped Fibers. The purpose is to standardize the characteristics of double-clad ytterbium-doped fibers.
- 2.Characteristics of Double-Clad Thulium-Doped Fibers. The purpose is to standardize the characteristics of double-clad thulium-doped fibers.
- 3.Characteristics of Double-Clad Erbium-Ytterbium Co-doped Optical Fibers. The purpose is to standardize the characteristics of double-clad erbium-ytterbium co-doped optical fibers.
- 4.Characteristics of Erbium-Doped Fibers. The purpose is to standardize the characteristics of erbium-doped fibers. Rare earth-doped optical fiber Part

1 Scope

GB/T 28504.4-2025 is the Chinese national standard covering erbium-doped fibre - the few metres of doped glass inside every optical amplifier, which is what made long-haul optical communication possible, with its absorption and gain spectra, its background loss and its geometry. Part 4 of the series, first edition of this part. It was issued on 31 December 2025 and has been in force since 1 July 2026, as a first edition. This page is published from the official record of the 2025 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document specifies the classification, geometry, and performance requirements of erbium-doped optical fibers, and describes the corresponding test methods. This document applies to erbium-doped fibers used in fiber amplifiers, fiber lasers, and spontaneous

emission light source products.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 14733.12 Telecommunications Terminology. Optical Fiber Communication

GB/T 15972.20 Fiber Optic Test Methods Specification Part

20.Measurement Methods and Test Procedures for Dimensional Parameters Fiber Optic Geometry parameter

GB/T 15972.21 Fiber Optic Testing Methods - Part

21.Measurement Methods and Test Procedures for Dimensional Parameters; Coating Geometry parameter

GB/T 15972.30 Fiber Optic Test Methods Specification Part

30.Measurement Methods and Test Procedures for Mechanical Properties - Fiber Optic Screening test

GB/T 15972.32 Fiber Optic Testing Methods - Part

32.Measurement Methods and Test Procedures for Mechanical Properties; Coatings peeling

GB/T 15972.33 Fiber Optic Testing Methods - Part

33.Measurement Methods and Test Procedures for Mechanical Properties - Stress Corrosion Sensitivity Sensitive parameters

GB/T 15972.34 Fiber Optic Test Methods Specification Part

34.Measurement Methods and Test Procedures for Mechanical Properties - Fiber Optic Warp

3 Terms and Definitions

The terms and definitions defined in GB/T 14733.12 and the following terms and definitions apply to this document.