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

GB/T 15972.40-2024

Replacing GB/T 15972.40-2008

**Specifications for optical fibre test methods - Part 40:
Measurement methods and test procedures for transmission
characteristics - Attenuation
(English Translation)**

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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.

This document is part 40 of GB/T 15972 "Specification for optical fiber test methods". GB/T 15972 has been published in the following parts.

--- Part 10: General principles for measurement methods and test procedures;

- Part 20: Measurement methods and test procedures for dimensional parameters Optical fiber geometric parameters;
- Part 21: Measurement methods and test procedures for dimensional parameters --- Geometric parameters of coatings;
- Part 22: Measurement methods and test procedures for dimensional parameters --- Length;
- Part 30: Measurement methods and test procedures for mechanical properties. Optical fiber screening tests;
- Part 31: Measurement methods and test procedures for mechanical properties Tensile strength;
- Part 32: Measurement methods and test procedures for mechanical properties. Strippability of coatings;
- Part 33: Measurement methods and test procedures for mechanical properties Stress corrosion sensitivity parameters;
- Part 34: Measurement methods and test procedures for mechanical properties of optical fiber warping;
- Part 40: Measurement methods and test procedures for transmission characteristics attenuation;
- Part 41: Measurement methods and test procedures for transmission characteristics bandwidth;
- Part 42: Measurement methods and test procedures for transmission characteristics Wavelength dispersion;
- Part 43: Measurement methods and test procedures for transmission characteristics Numerical aperture;
- Part 44: Measurement methods and test procedures for transmission characteristics and optical properties Cut-off wavelength;
- Part 45: Measurement methods and test procedures for transmission characteristics Mode field diameter;
- Part 46: Measurement methods and test procedures for transmission and optical properties --- Changes in transmittance;
- Part 47: Measurement methods and test procedures for transmission characteristics Macrobending losses;
- Part 48: Measurement methods and test procedures for transmission characteristics and optical properties Polarization mode dispersion;

--- Part 49: Measurement methods and test procedures for transmission characteristics
Differential mode delay;

--- Part 50: Measurement methods and test procedures for environmental performance ---
Steady state damp heat;

--- Part 51: Measurement methods and test procedures for environmental performance ---
Dry heat;

--- Part 52: Measurement methods and test procedures for environmental performance ---
Temperature cycling;

--- Part 53: Measurement methods and test procedures for environmental performance ---
Immersion in water;

--- Part 54: Measurement methods and test procedures for environmental performance
Gamma irradiation;

--- Part 55: Measurement methods and test procedures for environmental properties.
Hydrogen aging this document replaces GB/T 15972.40-2008 "Optical Fiber Test Methods
Specification Part 40: Measurement of Transmission Characteristics and Optical
Characteristics" Compared with GB/T 15972.40-2008, in addition to structural adjustments
and editorial changes, the main technical changes are the following.

- a) Added the provisions on optical fiber attenuation uniformity (see 3.5 and 4.4);
- b) Added environmental conditions for measurement and testing (see Chapter 6);
- c) Added detailed provisions for filtering out higher-order modes in B6 type optical fibers (see A.2.2.4);
- d) The applicable fiber types for the A1 multimode fiber injection conditions have been changed to not be limited to the graded-index type (see A.2.3, 2008 edition).
A.1.3);
- e) Added detailed provisions on the test length for category A1 multimode optical fiber attenuation (see A.2.3.1);
- f) Modified the optical injection regulations for category A1 multimode optical fibers (see A.2.3.3, A.1.3.2 of the 2008 edition);
- g) Added the example of A1 multimode optical fiber mode scrambler (see A.2.3.4);
- h) The applicable optical fiber types of A2, A3 and A4 multimode optical fiber injection devices are changed and are not limited to the step-change refractive index type (see A.2.4, A.1.4 of the 2008 edition);
- i) Added the calibration requirements for type A4 multimode optical fibre in method A (see A.2.5.2);

- j) Added calibration requirements for Method B (see B.2.3);
- k) The detailed provisions of Method C test have been changed, and the content of the note has been changed to the main text (see C.2.6, C.1.5 of the 2008 edition);
- l) The sample handling details of Method C have been changed, and the content of the note has been changed to the main text (see C.3, C.2 of the 2008 edition);
- m) Added calibration requirements for Method C (see C.4.7);
- n) Added an example of measurement results for a short section of A1 multimode optical fiber (see Appendix E);
- o) Added an example of the spectral attenuation model method (see Appendix F).

This document modifies and adopts IEC 60793-1-40:2019 "Optical Fiber Part 1-40.Measurement Methods and Test Procedures for Attenuation".

This document has the following structural adjustments compared to IEC 60793-1-40:2019.

--- 4.1 in Chapter 4 corresponds to paragraphs 2 to 6 of the main text of Chapter 1 in IEC 60793-1-40:2019, and 4.2 corresponds to A.1, 4.3 in IEC 60793-1-40:2019 corresponds to B.1, 4.4 in IEC 60793-1-40:2019 corresponds to IEC 60793-1-40.

C.1, 4.5 in 2019 correspond to D.1 in IEC 60793-1-40:2019;

--- Chapter 6 corresponds to Chapter 4 and Chapter 6 of IEC 60793-1-40:2019;

--- Chapter 10 corresponds to Chapter 10 and Chapter 11 of IEC 60793-1-40:2019.

The technical differences between this document and IEC 60793-1-40:2019 and their reasons are as follows.

--- The scope of application has been expanded to include Category C single-mode optical fiber (see Chapter 1) to provide guidance for application;

--- GB/T 15972.10-2021, GB/T 15972.22-2008 and GB/T 15972.43-2021 respectively with normative references Replaced IEC 60793-1-1:2017, IEC 60793-1-22:2001, IEC 60793-1-43:2015, the difference between the two documents the degree of consistency is modification;

--- Added GB/T 33779.1 to adapt to my country's technical conditions and improve operability;

--- Replaced IEC 60793-1-22:2001 with the normative reference GB/T 15972.22-2008, consistency between the two documents the degree of modification is to adapt to my country's technical conditions and improve operability;

--- Replaced IEC 60793-1-43 with the normative reference GB/T 15972.43 to adapt to my country's technical conditions and improve operability;