



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

GB/T 15972.45-2021

**Specifications for optical fibre test methods - Part 45:
Measurement methods and test procedures for transmission
characteristics - Mode field diameter**

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Foreword

GB/T 15972 "Specifications for Optical Fiber Test Methods" consists of several parts, and its expected structure and corresponding international standards are.

---Part 10~Part 19.General principles of measurement methods and test procedures (corresponding to IEC 60793-1-10 to IEC 60793-1-

19);

---Part 20~Part 29.Measurement methods and test procedures of dimensional parameters (corresponding to IEC 60793-1-20 to IEC 60793-

1-29);

---Part 30~Part 39.Measurement methods and test procedures of mechanical properties (corresponding to IEC 60793-1-30 to IEC 60793-

1-39);

---Part 40~Part 49.Measurement methods and test procedures of transmission characteristics (corresponding to IEC 60793-1-40 to IEC 60793-

1-49);

---Part 50~Part 59.Environmental performance measurement methods and test procedures (corresponding to IEC 60793-1-50 to IEC 60793-

1-59).

Among them, GB/T 15972.40~49 consists of the following parts.

---Part 40.Measurement methods and test procedures for transmission characteristics attenuation;

---Part 41.Measurement methods of transmission characteristics and test procedure bandwidth;

---Part 42.Measurement methods and test procedures for transmission characteristics. Wavelength dispersion;

---Part 43.Measurement methods of transmission characteristics and test procedures numerical aperture;

---Part 44.Measurement methods of transmission characteristics and test procedures cut-off wavelength;

---Part 45.Measurement methods and test procedures for transmission characteristics; Mode field diameter;

---Part 46.Transmission characteristics measurement methods and test procedures light transmittance changes;

---Part 47.Measurement methods and test procedures for transmission characteristics, macrobending loss;

---Part 48.Measurement methods and test procedures for transmission characteristics Polarization mode dispersion;

---Part 49.Differential modulus delay for measurement methods and test procedures of transmission characteristics.

This part is Part 45 of GB/T 15972.

This section was drafted in accordance with the rules given in GB/T 1.1-2009.

This part replaces GB/T 15972.45-2008 "Specification for optical fiber test methods Part 45.Measurement of transmission characteristics and optical characteristics

Methods and Test Procedures Mode Field Diameter". Compared with GB/T 15972.45-2008, the main technical changes in this part are as follows.

- Modified the name of the standard;
- Added an overview of the test device (see 4.1);
- Added the sample requirements for B6 fiber in the high-order mode stripper (see 4.6);
- The sample requirements for B6 fiber in the sample length have been added (see 5.1);
- Modified the sample length requirements of B1.1 to B6 types of fibers (see 5.1, 5.1 in the.2008 edition);
- Added the structural changes in this part of Appendix A compared with IEC 60793-1-45.2017 (see Appendix A);
- The computer chapter in Appendix B has been added (see B.1.3);
- Added the sampling data chapters in Appendix B, C and D (see B.4, C.4 and D.4);
- Added the requirements for measuring B6 type optical fiber in Appendix C (see C.1.2.2);
- Deleted the device requirements for B3 type optical fiber (see B.1.2.2 of the.2008 edition),
- Added the device requirements for B5 type optical fiber (see C.1.2.3);
- Added formula (E.1) (see E.4);
- Modified the formula (E.2) (see E.4, D.4 of the.2008 edition);
- Revised the data in Table F.1, Table F.2 and Table F.3 (see Appendix F, Table E.1, Table E.2 and Table E.3 of the.2008 edition).

This part uses the redrafting method to modify and adopt IEC 60793-1-45.2017 "Optical Fiber Part 45.Measurement Methods and Test Procedures

Diameter of the mode field".

Compared with IEC 60793-1-45.2017, this part has many structural adjustments. Appendix A lists this part and IEC 60793-

1-45.2017 chapter number comparison list.

The technical differences between this part and IEC 60793-1-45.2017 and the reasons are as follows.

---Regarding normative reference documents, this section has made adjustments with technical differences to adapt to my country's technical conditions and adjustments.

The situation is collectively reflected in Chapter 2 "Normative Reference Documents", and the specific adjustments are as follows.

* Deleted IEC 60793-2 (see Chapter 2 of the IEC document);

* Replace IEC 60793-1-40:2001 (see Chapter 2) with GB/T 15972.40-2008 modified to adopt international standards;

--- Deleted the content of Chapter 3 "Terms and Definitions" and Chapter 5 Benchmark Test Methods of the IEC document, because the "Terms and Definitions" in the IEC document "Definition" has no actual content, and the benchmark test method is incorporated into Chapter 3 "Test Method Overview" of this part (see IEC document Chapter 3 and Chapter 5);

--- Due to the consideration of the influence of connection loss changes on the measurement, the requirements for optical fiber connectors in Appendix E (see E.2.6) have been added;

--- The verification test section of Appendix E has been revised, and the specific calculation formula for the equivalent level has been added (see E.4.3).

This section has made the following editorial changes.

--- Amend the name to "Specifications for Optical Fiber Test Methods Part 45.Measurement Methods and Test Procedures for Transmission Characteristics, Mode Field Direct path".

Please note that some of the content in this section may involve patents. The issuing agency of this section is not responsible for identifying these patents.

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

This part is under the jurisdiction of the National Communication Standardization Technical Committee (SAC/TC485).

Drafting organizations of this section. Fiberhome Technology Group Co., Ltd., Chengdu Terui Communication Equipment Testing Co., Ltd.

1 Scope

This part of GB/T 15972 specifies the test method for the optical fiber mode field diameter, and establishes the test equipment, injection conditions, procedures, calculations

Uniform requirements for methods and results.

This section applies to the measurement of the mode field diameter of Class B single-mode optical fibers.

2 Normative references

The following documents are indispensable for the application of this document. For dated