



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

GB/T 15972.34-2021

**Specifications for optical fibre test methods - Part 34:
Measurement methods and test procedures for mechanical
characteristics - Fibre curl**

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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.General principles of measurement methods and test procedures (corresponding to IEC 60793-1-1);

---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 15972.3x consists of the following parts.

---Part 30.Measurement methods and test procedures of mechanical properties, optical fiber screening test;

---Part 31.Measuring methods of mechanical properties and test procedures for tensile

strength;

---Part 32.Measurement methods and test procedures for mechanical properties, coating peelability;

---Part 33.Measurement methods of mechanical properties and test procedures for stress corrosion sensitivity parameters;

--- Part 34.Measurement methods and test procedures for mechanical properties of optical fiber warpage.

This part is part 34 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 15972.34-2008 "Specification for Optical Fiber Test Methods Part 34.Measurement Methods and Tests of Mechanical Properties

Procedure Fiber Warping." Compared with GB/T 15972.34-2008, the main technical changes in this part are as follows.

---Modified the step length of the rotating fiber (see A.3.3, B.3.3, 6.2, A.3.2, B.3.2 of the.2008 edition);

---Modified the name of the calculation method of the deviation, and the calculation formula of the Fourier fitting method in the calculation method (see A.4.1, A.4.2,

The.2008 version of A.4.1, A.4.2);

---Added the calculation process of the intermediate parameter SA of the optical fiber warpage measured by the laser beam scattering method (see B.4.1, B.4.2);

---Added the formula derivation process of laser beam scattering method to measure fiber warpage (see C.2).

This part uses the redrafting method to modify and adopt IEC 60793-1-34.2006 "Optical Fiber Part 1-34.Measurement Methods and Test Procedures

Optical fiber warpage.

Compared with IEC 60793-1-34.2006, the structural changes of this part are as follows.

--- Due to the addition of "Chapter 3 Method Overview" in accordance with the format and presentation requirements of my country's standards, the International Standard Chapter 3,

Chapter 4 and Chapter 5 have been extended to Chapter 4, Chapter 5, and Chapter 6;

---Adjust International Standard 5.3 to Chapter 7 of this Part;

--- The contents of Chapters 7 and 8 of the International Standard are merged into Chapter 8 of this Part.

The technical differences between this part and IEC 60793-1-34:2006 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.

* Replace IEC 60793 (all parts) with GB/T 15972.10 which is modified to adopt international standards.

---The chapter "Method Overview" is added, and part of Chapter 1 of the International Standard is included in this chapter (see Chapter 3);

--- Modify the position identification of the center line sensor in Figure B.1, and correct ΔZ to ΔS ;

---Correct ΔZ in formula (C.5) and formula (C.10) to Z_G , and correct $\Delta Z_{\Omega 21}$ in formula (C.13) to $Z_{\Omega 21}$; change the formula

(C.13) Medium ΔZ

Z_{2G}

r_{2c}

Corrected to Z

r_{2c}

--- Modify the "=" in the formulas (C.13), (C.14), (C.15), (C.16) in Appendix C to "~".

This section has made the following editorial changes.

---In order to be consistent with the existing standard system, the standard name is changed to "Optical Fiber Test Method Specification Part 34.Measurement Method of Mechanical Properties

Methods and test procedures for optical fiber warpage.

1 Scope

This part of GB/T 15972 gives the test method for measuring the warpage or intrinsic radius of curvature of uncoated optical fiber, and specifies the test device,

Uniform requirements for sample preparation, procedures, calculations, and results.

This section applies to A1, A2, A3 multi-mode fiber and B single-mode fiber.

2 Normative references

The following documents are indispensable for the application of this document. For dated reference documents, only the dated version applies to this article

Pieces. For undated reference documents, the latest version (including all amendments) is applicable to this document.

GB/T 15972.10 Optical fiber test method specification Part 10. General rules of measurement methods and test procedures (GB/T 15972.10-2021, IEC 60793-1-1.2017, MOD)

3 Method overview

When using passive alignment fusion splicers or active alignment batch fusion splicers, fiber warpage is an important parameter that affects splice loss.

Appendix A and Appendix B respectively give two test methods for measuring the warpage (or radius of curvature) of uncoated optical fibers.

---Method A. Side view microscopy technology;

---Method B. Laser beam scattering technology.

Both methods measure the radius of curvature of the uncoated fiber by determining the amount of deviation that the unsupported fiber end produces when it rotates around the fiber axis.

(Warpage). Method A uses image or digital video methods to determine the amount of deviation, while method B uses a line sensor to measure the phase of a laser beam.

The maximum deviation from the reference laser beam.

By measuring the deviation of the optical fiber rotating around a fixed axis, and understanding the geometric meaning of the measuring device, the radius of curvature of the optical fiber can be passed

A simple circle model is calculated, and the derivation formula is shown in Appendix C.

Method A is the benchmark test method (RTM), used as a referee test.

The environmental conditions of the test should meet the requirements of GB/T 15972.10.

4.1 Principle

Place one end of the uncoated optical fiber in the fiber clamp, and make the end freely extend out of the clamp for a specified hanging distance, typical hanging distance

The distance is generally 10mm~20mm. If the hanging distance in the device is designed to