



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

GB/T 15972.30-2021

**Specifications for optical fibre test methods - Part 30:
Measurement methods and test procedures for mechanical
characteristics - Fibre proof test**

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Table of Contents

1 Scope	1
2 Normative references	1
3 Method overview	1
4 Device	2
5 Sample preparation	5
6 Procedure	5
7 Results	5
Reference	7

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 30 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 15972.30-2008 "Specification for Optical Fiber Test Methods Part 30.Measurement Methods and Tests of Mechanical Properties

Procedural fiber screening test. Compared with GB/T 15972.30-2008, the main technical changes in this part are as follows.

---Added 3.1 Note 2 of calculating the stress of the optical fiber from the applied tension T (see 3.1);

---Added the requirements for the typical value of the maintenance time of the applied tensile load (see 3.2);

---Modified the requirements for passing the test (see 3.3, 3.3 of the.2008 edition);

---Added a note on the difference between online screening and non-online screening by equipment (see 4.1);

---Added the requirements for the screening test area (see 4.3);

---Added a brake wheel type equipment design method (see 4.7.2).

This part uses the redrafting method to modify and adopt IEC 60793-1-30.2010 "Optical Fiber Part 1-30.Measurement Methods and Test Procedures"

Optical fiber screening test.

Compared with IEC 60793-1-30.2010, the structural changes of this part are as follows.

---Due to the addition of Chapter 3 and Figure 1, Chapter 3, Chapter 4, and Chapter 5 of the International Standard have been postponed to Chapter 4, Chapter 5, and Chapter 6

Chapter, Figure 1 and Figure 2 are extended to Figure 2 and Figure 3; Chapter 6 of the international standard is deleted;

---Incorporating the contents of Chapter 8 of the International Standard into Chapter 7.

The technical differences between this part and IEC 60793-1-30.2010 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.

* Added reference to GB/T 15972.10.

---In Chapter 3 of this part, referring to ITU-TG.650.1 (2010), the formula for stress and strain is added, and the international standard is deleted.

The calculation formula in Chapter 6.

This section has made the following editorial changes.

---In order to be consistent with my country's standard system, the standard name is changed to "Optical Fiber Test Method Specification Part 30.Measurement Method of Mechanical Properties

Methods and test procedures for optical fiber screening test.

1 Scope

This part of GB/T 15972 specifies the screening test method for continuous length optical fiber by applying the specified tension, and establishes the measurement system.

1 Test procedures and technical requirements.

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)

3.1 Benchmark test method. longitudinal tension method

In this test, tension is applied to a complete continuous-length optical fiber. After the loading

test, the initial length may be broken into several short sections.

All segments are considered to have passed the screening test.

The standard atmospheric environmental conditions used for storage and testing should meet the requirements of GB/T 15972.10.

Stress σ or strain ϵ can be used in the measurement, and their relationship is shown in formula (1).

$$\sigma = E_0(1 - C\epsilon)\epsilon \quad (1)$$

Where.

E_0 ---Young's modulus under zero stress, in gigapascals (GPa);

C ---a non-linear parameter (typical value is between 3~6).

From the applied tension T (in Newtons, N) to calculate the fiber stress, see formula (2).

$$\sigma =$$

$$(1 - F)T$$

$$\pi a^2 \times$$

103 (2)

Where.

a ---The radius of the glass fiber, in micrometers (μm);

F ---The tension ratio assumed by the coating layer.

Where F is given by formula (3).

$$F =$$

$$\sum_{j=1}^n$$

$$\frac{E_j A_j}{E_0 A_0}$$

$$\frac{E_j \pi a_j^2}{E_0 \pi a_0^2}$$

$$\sum_{j=1}^n$$

$$\frac{E_j A_j}{E_0 A_0}$$

$$(3)$$