



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

GB/T 15972.54-2021

**Specifications for optical fibre test methods - Part 54:
Measurement methods and test procedures for environmental
characteristics - Gamma irradiation**

Issued on: April 30, 2021

Implemented on: November 1, 2021

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

Table of Contents

1 Scope	1
2 Normative references	1
3 Background overview	1
4 Test device	1
5 Samples and sample preparation	3
6 Test procedure	4
7 Calculation	5
8 Results	6
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~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 15972.50~59 currently consists of the following parts.

---Part 50.Measurement methods and test procedures for environmental performance constant damp heat;

---Part 51.Environmental performance measurement methods and test procedures dry heat;

---Part 52.Environmental performance measurement methods and test procedures 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.Environmental performance measurement methods and test procedures Hydrogen aging.

This part is part 54 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 15972.54-2008 "Specification for optical fiber test methods-Part 54.Environmental performance measurement methods and tests

Procedural Gamma Irradiation.

Compared with GB/T 15972.54-2008, the main technical changes in this part are as follows.

---The normative references of GB/T 15972.46 have been added (see Chapter 2);

---Added Chapter 3 background overview (see Chapter 3);

--- Deleted Appendix A and put the content in the newly added Chapter 3 (see Appendix A of the.2008 edition);

---Added the danger warning in the overview part of the experimental device (see 4.1);

---Deleted the specific requirements of the light source, optical filter/monochromator (see 3.2, 3.3 of the.2008 edition);

--- Amend "A2.1 and A2.2 multimode fiber (refractive index quasi-abrupt and abrupt)" to "A2 multimode fiber (refractive index quasi-abrupt)"

Mutations and mutants)" (see 4.8.2, 3.7.3 of the.2008 edition);

---Modified the optical power requirements of the light source coupled into the sample, and changed "not greater than 1.0μW" to "equal to 1.0μW" (see 4.10,.2008

3.9 of the year edition);

---Added the uniform requirements for the length of environmental background radiation test specimens and hazardous nuclear environmental test specimens (see 5.2);

---The requirements for the test shaft and alternative placement method are modified, and the diameter of the test spool is not less than 10cm, and the alternative placement method should be

Consider the minimum bend radius of the fiber (see 5.3, 4.4 in the.2008 edition);

---Deleted the provisions of the inspection equipment for the calibration of the radiation source (see 5.1 in the.2008 edition);

---Added an overview of the test procedure (see 6.1);

---Added the requirement for the total attenuation fluctuation after the end of radiation, stipulating that the total fluctuation should be less than 10% of the total attenuation caused (see

6.3.2);

---The test method requirements for light transmittance changes have been added, and the light transmittance changes of harmful nuclear radiation effects exposed to gamma radiation have been specified

It should be carried out in accordance with the method of GB/T 15972.46 (see 6.5);

--- Added reference IEC /T R62283 (see References).

This part uses the redrafting method to modify and adopt IEC 60793-1-54.2018 ``Optical Fiber Part 1-54.Measurement Methods and Tests

Procedural Gamma Irradiation.

Compared with IEC 60793-1-54.2018, the main structural differences and reasons for this part are as follows.

---Move the description of the relevant background in the scope to Chapter 3 "Background Overview" of this part (see Chapter 3, Chapter 1 of the IEC document);

--- Deleted Chapter 3 "Terms and Definitions" because there is no actual content (see Chapter 3 of the IEC document);

---Chapter 9 "Specification Information" is deleted, because the relevant requirements have been incorporated into Chapter 8 "Results" of this part (see Chapter 9 of the IEC document chapter).

The technical differences between this part and IEC 60793-1-54.2018 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

It is concentratedly reflected in Chapter 2 "Normative Reference Documents", and the specific adjustments are as follows.

- * Replace IEC 60793-1-40 with GB/T 15972.40 which is modified to adopt international standards;
- * Replace IEC 60793-1-44 with GB/T 15972.44 modified to adopt international standards;
- * Replace IEC 60793-1-46 with GB/T 15972.46 modified to adopt international standards;
- * Deleted IEC 61280-4-1, because this part does not reference the standard (see Chapter 2 of the IEC document).

1 Scope

This part of GB/T 15972 specifies the measurement methods and test procedures for evaluating the performance of optical fibers and cables in a given gamma radiation environment.

This part is applicable to the determination of cabled or uncabled type A1, A2 type multimode fiber and type B single-mode fiber due to exposure to gamma radiation.

The raw radiation induction attenuation value. This section does not apply to the measurement of non-light-transmitting component materials in optical cables. If the optical cable material is exposed to radiation, it will

If deterioration occurs, further research and other measurement methods are needed.

Note. The applicability of this test to other types of optical fibers is under study. Refer to IEC /T R62283 for detailed background information.

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 15972.40-2008 Optical fiber test method specification Part 40.Transmission characteristic measurement method and test procedure Attenuation

(IEC 60793-1-40.2001, MOD)

GB/T 15972.44 Specification for optical fiber test methods Part 44.Measurement methods