

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Optical fibre cables – Part 1-306: Generic specification – Basic optical cable test procedures – Cable element test methods – Ribbon torsion, Method G6**

**Câbles à fibres optiques – Partie 1-306: Spécification générique – Procédures fondamentales d'essai des câbles optiques – Méthodes d'essai des éléments de câbles – Torsion du ruban, méthode G6**



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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## OPTICAL FIBRE CABLES –

**Part 1-306: Generic specification – Basic optical cable test procedures –  
Cable element test methods – Ribbon torsion, method G6**

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IEC 60794-1-306 has been prepared by subcommittee 86A: Fibres and cables, of IEC technical committee 86: Fibre optics. It is an International Standard.

This document partially cancels and replaces IEC 60794-1-23:2019.

This edition includes the following significant technical changes with respect to IEC 60794-1-23:2019:

- a) change the scope, not include partially-bonded ribbon;
- b) add some details to the procedure.

The text of this International Standard is based on the following documents:

Draft	Report on voting
86A/2368/FDIS	86A/2372/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

A list of all parts in the IEC 60794 series, published under the general title *Optical fibre cables*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under [webstore.iec.ch](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

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## INTRODUCTION

This document contains method G6 of IEC 60794-1-23:2019, which will be withdrawn. The system for optical fibre test methods have been restructured and renumbered. The optical cable element test methods contained in IEC 60794-1-23:2019 will now be individually numbered in the IEC 60794-1-3xx series. Each test method is now considered to be an individual document rather than part of a multi-test method compendium. Full cross-reference details are given in IEC 60794-1-2.

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## OPTICAL FIBRE CABLES –

### Part 1-306: Generic specification – Basic optical cable test procedures – Cable element test methods – Ribbon torsion, method G6

#### 1 Scope

This part of IEC 60794 describes test procedures to verify the mechanical and functional integrity of the fibre ribbon structure. The test determines the capability of the ribbon to withstand torsion without delamination between optical fibre and ribbon bonding agent.

This document applies to optical fibre ribbons in optical cables for use with telecommunication equipment and devices employing similar techniques, and to optical fibre ribbons in cables having a combination of both optical fibres and electrical conductors.

This document is not applicable to partially-bonded ribbons. The method for partially-bonded ribbons is under consideration.

Throughout the document, the wording "optical cable" can also include optical fibre units, microduct fibre units, etc.

NOTE The environmental testing of optical fibre ribbon would be valuable for some applications. Useful information about suitable test methods can be found in the optical fibre standards IEC 60793-1-50, IEC 60793-1-51, IEC 60793-1-52, and IEC 60793-1-53.

#### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60794-1-2, *Optical fibre cables – Part 1-2: Generic specification – Basic optical cable test procedures – General guidance*

#### 3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

#### 4 General requirements

IEC 60794-1-2 is the reference guide to test methods of all types. It shall be considered for general requirements and definitions.



## 5 Sample

Unless otherwise specified in the detail specification, five representative samples, each with sufficient length to perform applicable tests, for example a minimum length of 120 mm, are obtained from the ribbon to be tested.

## 6 Apparatus

The testing apparatus, an example of which is in Figure 1, consists of two vertically clamps to hold the sample while it is twisted under a specified tension load. The upper clamp shall be designed to hold the upper ribbon and ensure the specimen to rotate about the vertical axis. The lower clamp shall hold the lower ribbon and be free to move along the vertical axis. Usually, the minimum length to be tested is 100 mm, the other value(s) agreed upon between the customer and supplier as defined in the detail specification.

Dimensions in millimetres

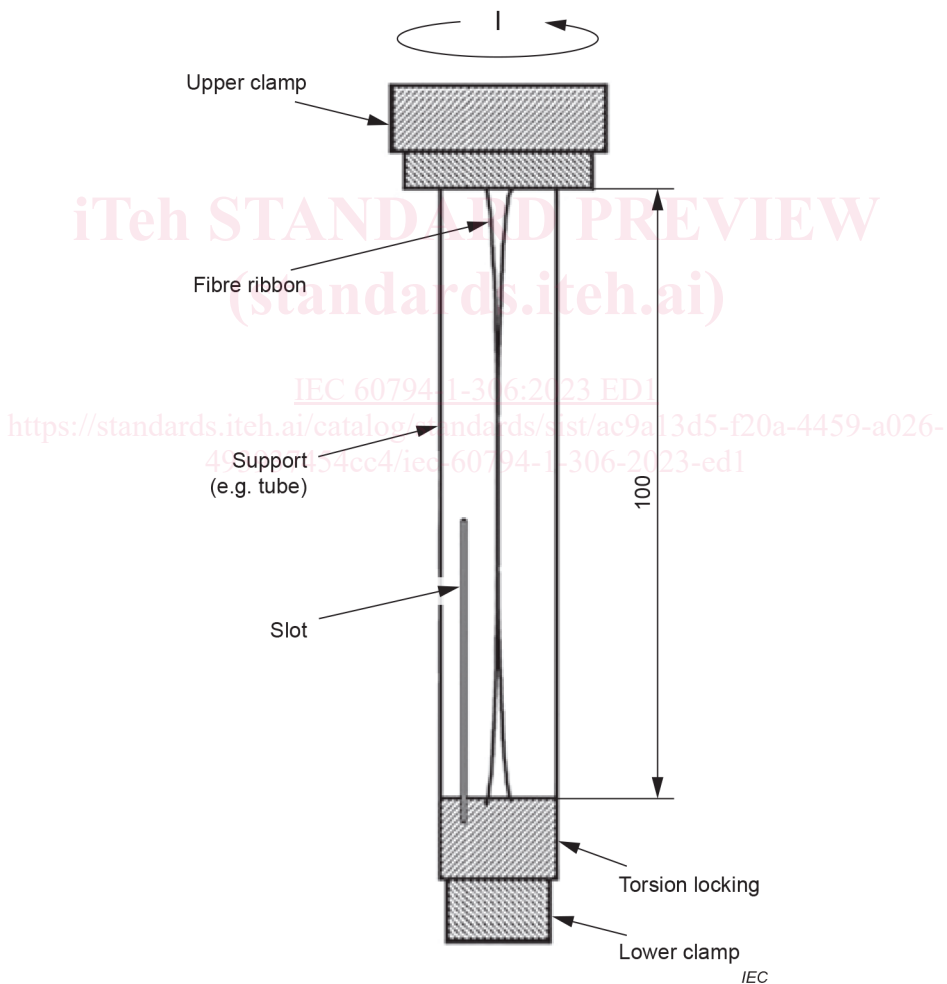


Figure 1 – Torsion test

## 7 Procedure

Perform the following steps.

- a) Fix the ribbon sample firmly and vertically into the upper clamp without damage. The total mass of the lower clamp group shall not be less than 100 g.
- b) Rotate the upper clamp assembly, twist the sample in increments of  $180^\circ \pm 5^\circ$  smoothly and steadily within a time of 2 s in one direction, then return to the starting position. Twist the sample  $180^\circ \pm 5^\circ$  in the opposite direction, and again, back to the starting position. The total process constitutes one cycle. The minimum dwell time after each twist increment is 5 s.
- c) Repeat step b), the incremental twisting is continued to the value(s) agreed upon between the customer and supplier, as defined in the detail specification, or until delamination occurs.

## 8 Requirements

The ribbon shall withstand the number of  $180^\circ$  turns/cycles stated in the detail specification until delamination occurs.

## 9 Details to be specified

The detail specification shall include the following:

- a) number of samples;
- b) sample length;
- c) test length;
- d) number of turns/cycles;
- e) mass. <https://standards.iteh.ai/catalog/standards/sist/ac9a13d5-f20a-4459-a026-493937454cc4/iec-60794-1-306-2023-ed1>

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## Bibliography

IEC 60793-1-50, *Optical fibres – Part 1-50: Measurement methods and test procedures – Damp heat (steady state) tests*

IEC 60793-1-51, *Optical fibres – Part 1-51: Measurement methods and test procedures – Dry heat (steady state) tests*

IEC 60793-1-52, *Optical fibres – Part 1-52: Measurement methods and test procedures – Change of temperature tests*

IEC 60793-1-53, *Optical fibres – Part 1-53: Measurement methods and test procedures – Water immersion tests*

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