

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Optical fibre cables –
Part 1-305: Generic specification – Basic optical cable test procedures – Cable
element test methods – Ribbon tear (separability), Method G5**

**Câbles à fibres optiques –
Partie 1-305: Spécification générique – Procédures fondamentales d'essai des
câbles optiques – Méthodes d'essai des éléments de câble – Déchirure du ruban
(séparabilité), Méthode G5**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

OPTICAL FIBRE CABLES –

**Part 1-305: Generic specification – Basic optical cable test procedures –
Cable element test methods – Ribbon tear (separability), Method G5**

FOREWORD

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IEC 60794-1-305 has been prepared by subcommittee 86A: Fibres and cables, of IEC technical committee 86: Fibre optics. It is an International Standard.

This first edition of IEC 60794-1-305 cancels and replaces method G5 of the second edition of IEC 60794-1-23 published in 2019. This edition constitutes a technical revision.

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

- a) 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.

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

Draft	Report on voting
86A/2249/FDIS	86A/2271/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. The main document types developed by IEC are described in greater detail at 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 in the data related to the specific document. At this date, the document will be

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INTRODUCTION

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OPTICAL FIBRE CABLES –

Part 1-305: Generic specification – Basic optical cable test procedures – Cable element test methods – Ribbon tear (separability), Method G5

1 Scope

This part of IEC 60794 describes test procedures to be used in establishing uniform requirements for optical fibre ribbons as optical fibre cable elements for the mechanical property-tear (separability).

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

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

This test is applicable for edge-bonded ribbons and encapsulated ribbons specified in IEC 60794-1-31, and not intended to be used for partially-bonded ribbons.

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*

IEC 60794-1-31, *Optical fibre cables – Part 1-31: Generic specification – Optical cable elements – Optical fibre ribbon*

3 Terms and definitions

No terms and definitions are listed in this document.

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://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 Method G5: Ribbon tear (separability)

5.1 Object

The purpose of this test is to ensure sufficient tear resistance for ribbons where the fibres are not required to be separable, or to ensure sufficient separability of the fibres for ribbons where the fibres are required to be separated. The intention of this test is to be able to tear the ribbon by hand without damage to the fibre coatings.

5.2 Sample

A number of samples of fibre ribbon, as specified in the detail specification, typically 3 to 5, shall be selected from the ribbon or ribbons to be tested. The length of each sample shall be sufficient to provide the number of test specimens as detailed below.

For an n fibre ribbon, $n/2$ specimens are taken from each of the samples above. Each specimen shall be 100 mm minimum in length, consistent with Figure 1.

Prepare the $n/2$ specimens involving increasing numbers of fibres to be separated as a ribbon unit: that is, a specimen for fibre 1; a specimen for fibres 1 to 2; a specimen for fibres 1 to 3; etc.

The fibres to be tested are separated with a knife or other suitable method on a suitable length of no less than 30 mm for clamping, as shown in Figure 1.

For the first sample, the preparation of the test sequence shall consist in separating one fibre from the other fibres in the ribbon in the first specimen. Then separate a unit of two fibres from the next specimen. After that, units of three, four, and so on, fibres are separated in the other specimens, up to a unit of $n/2$ fibres in the last specimen.

Do the same preparation for all the other samples.

NOTE If n is an odd number, $n/2$ in the above description is replaced with $(n-1)/2$.

Dimensions in millimetres

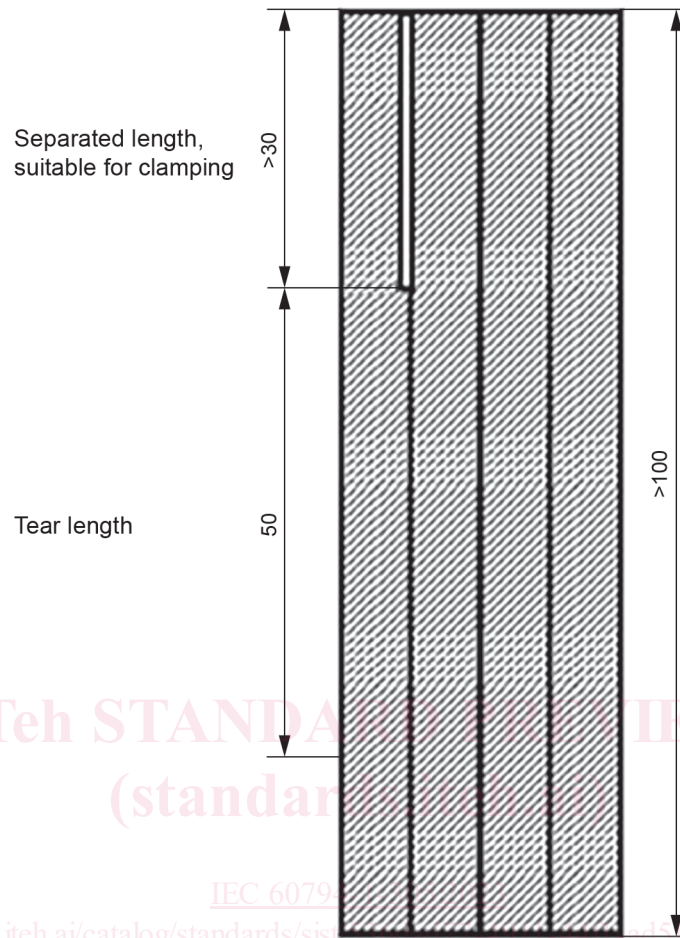


Figure 1 – Sample preparation for ribbon separability test

5.3 Apparatus

The apparatus consists of

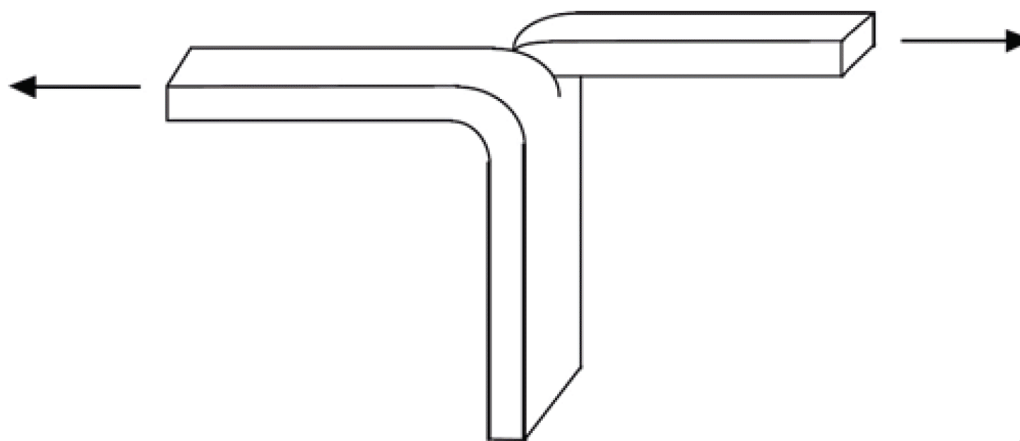
- a) a tensile strength measuring apparatus with suitable clamping devices and suitable force recording functions, and
- b) a microscope with at least 100× magnification.

5.4 Procedure

The specimen is inserted into the strength measuring apparatus, as shown in Figure 2. The fibres to be tested are torn at a speed of approximately 100 mm/min to 500 mm/min. The force to tear the fibres on a minimum length of 50 mm is continuously recorded.

In the case where fibres are required to be separated, the primary coating of the separated fibre(s) shall be visually inspected by means of a microscope.

The procedure is repeated for the specimens involving separation of fibre 1, fibres 1 to 2, fibres 1 to 3, etc., up through fibres 1 to $n/2$.



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Figure 2 – Separability procedure

5.5 Requirements

The primary requirement is to be able to make the tear without fibre damage (coating damage or fibre breakage). For ribbons where the fibres are required to be separated, the coloured primary coating of the separated fibre(s) shall be effectively free from ribbon matrix residues.

Any colour coding of fibres shall remain sufficiently intact within any 25 mm segment to enable individual fibres to be distinguished from each other.

The minimum or maximum, and mean tear forces shall be as specified in the detail specification.

5.6 Details to be specified

The detail specification shall include the following:

- minimum and mean tear force, in N, when fibres are not required to be separated;
- maximum and mean tear force, in N, as required by the detail specification, when fibres are required to be separated;
- number of samples;
- type of ribbon (separable or non-separable).

5.7 Details to be reported

The following items shall be reported in the test report:

- tear force results;
 - size of tested ribbon;
 - ribbon separated length (see Figure 1);
 - ribbon tear length (see Figure 1);
 - speed of ribbon tear.
-