

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Optical fibre cables –**  
**Part 1-308: Generic specification – Basic optical cable test procedures – Cable element test methods – Ribbon residual twist test, method G8**

**Câbles à fibres optiques –**  
**Partie 1-308: Spécification générique – Procédures fondamentales d'essais des câbles optiques – Méthodes d'essais des éléments de câbles – Essai de torsion résiduelle du ruban, méthode G8**



**THIS PUBLICATION IS COPYRIGHT PROTECTED**  
**Copyright © 2023 IEC, Geneva, Switzerland**

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Secretariat  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland

Tel.: +41 22 919 02 11  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

#### About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

#### About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

#### IEC publications search - [webstore.iec.ch/advsearchform](http://webstore.iec.ch/advsearchform)

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

#### IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

#### IEC Customer Service Centre - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: [sales@iec.ch](mailto:sales@iec.ch).

#### IEC Products & Services Portal - [products.iec.ch](http://products.iec.ch)

Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

#### Electropedia - [www.electropedia.org](http://www.electropedia.org)

The world's leading online dictionary on electrotechnology, containing more than 22 300 terminological entries in English and French, with equivalent terms in 19 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

#### A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

#### A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

#### Recherche de publications IEC -

#### [webstore.iec.ch/advsearchform](http://webstore.iec.ch/advsearchform)

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études, ...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

#### IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

#### Service Clients - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: [sales@iec.ch](mailto:sales@iec.ch).

#### IEC Products & Services Portal - [products.iec.ch](http://products.iec.ch)

Découvrez notre puissant moteur de recherche et consultez gratuitement tous les aperçus des publications. Avec un abonnement, vous aurez toujours accès à un contenu à jour adapté à vos besoins.

#### Electropedia - [www.electropedia.org](http://www.electropedia.org)

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 300 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 19 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

---

**Optical fibre cables –**  
**Part 1-308: Generic specification – Basic optical cable test procedures – Cable element test methods – Ribbon residual twist test, method G8**

**Câbles à fibres optiques –**  
**Partie 1-308: Spécification générique – Procédures fondamentales d'essais des câbles optiques – Méthodes d'essais des éléments de câbles – Essai de torsion résiduelle du ruban, méthode G8**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

---

ICS 33.180.10

ISBN 978-2-8322-6471-3

**Warning! Make sure that you obtained this publication from an authorized distributor.**  
**Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

## CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references .....	6
3 Terms and definitions .....	6
4 General requirements .....	6
5 Sample.....	7
6 Apparatus.....	7
7 Procedure.....	7
8 Requirements .....	8
9 Details to be specified .....	8
Bibliography.....	9

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[IEC 60794-1-308:2023](#)

<https://standards.iteh.ai/catalog/standards/sist/1074c0bf-3f0c-4e59-9a70-763a43fd13a9/iec-60794-1-308-2023>

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## OPTICAL FIBRE CABLES –

**Part 1-308: Generic specification – Basic optical cable test procedures –  
Cable element test methods – Ribbon residual twist test, method G8**

## FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 60794-1-308 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 change with respect to IEC 60794-1-23:2019: mention in Clause 1 that this test is not applicable to partially-bonded ribbons.

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

Draft	Report on voting
86A/2272/FDIS	86A/2297/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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[IEC 60794-1-308:2023](https://standards.iteh.ai/catalog/standards/sist/1074c0bf-3f0c-4e59-9a70-763a43fd13a9/iec-60794-1-308-2023)

<https://standards.iteh.ai/catalog/standards/sist/1074c0bf-3f0c-4e59-9a70-763a43fd13a9/iec-60794-1-308-2023>

## INTRODUCTION

This document contains method G8 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.

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[IEC 60794-1-308:2023](https://standards.iteh.ai/catalog/standards/sist/1074c0bf-3f0c-4e59-9a70-763a43fd13a9/iec-60794-1-308-2023)

<https://standards.iteh.ai/catalog/standards/sist/1074c0bf-3f0c-4e59-9a70-763a43fd13a9/iec-60794-1-308-2023>

## OPTICAL FIBRE CABLES –

### Part 1-308: Generic specification – Basic optical cable test procedures – Cable element test methods – Ribbon residual twist test, method G8

#### 1 Scope

This part of IEC 60794 describes test procedures to evaluate the degree of permanent twist in an uncabled ribbon or in a cabled optical fibre ribbon.

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

To evaluate the degree of permanent twist in a cabled ribbon, ribbon samples shall be taken from a preconditioned (aged) test cable.

To evaluate the degree of permanent twist in an uncabled ribbon, ribbon samples shall be taken from a preconditioned (aged) test uncabled ribbon.

The samples shall be of a length sufficient to include the gauge length of 50 cm and additional length on each end to facilitate attachment of clamps and the test weight.

## 6 Apparatus

The apparatus shall be constructed to have the following characteristics.

- The ribbon shall hang vertically, clamped at the top, with the bottom end free to rotate and translate as necessary.
- A mass shall be attached to the bottom end of the ribbon sample, with the gauge length situated between the top clamp and the bottom mass.
- The bottom mass shall be arranged so that it does not impart any twisting or side loading of the ribbon.
- The gauge length shall be 50 cm ± 5 cm, unless otherwise specified.
- The mass shall be 100 g ± 5 g, unless otherwise specified.
- A method shall be provided to measure the axial rotation of the lower end of the ribbon gauge length with respect to the upper end.

## 7 Procedure

Perform the following steps.

- 1) Precondition the ribbon at 85 °C ± 2 °C, uncontrolled relative humidity, for 30 days.  
For uncabled ribbons, precondition the ribbon directly; for cabled ribbons, precondition the ribbon in its cable, unless otherwise specified.
- 2) Take the ribbon samples from the preconditioned test ribbon or cabled ribbon.
- 3) Mount one end of the ribbon in the top clamp.
- 4) Attach the bottom mass.
- 5) Allow the ribbon to rotate. When the rotation settles out and the ribbon becomes still, measure the angular rotation of the bottom end of the gauge length with respect to the upper end of the gauge length.
- 6) Calculate the residual twist of the sample according to Formula (1):

$$T = \frac{\theta}{L} \quad (1)$$

where

$T$  is the residual twist, in °/cm;

$\theta$  is the final angle from top to bottom, in °;

$L$  is the measured gauge length, in cm.

## 8 Requirements

The calculated residual twist of optical fibre ribbon shall not exceed the maximum residual twist requirements of the detail specification. In most cases, a maximum residual twist of 8°/cm is adequate.

## 9 Details to be specified

The detail specification shall include the following:

- a) the preconditioning conditions, if different from those stated above;
- b) the ribbon gauge length, if different from that stated above;
- c) the tension mass, if different from that stated above.

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

[IEC 60794-1-308:2023](https://standards.iteh.ai/catalog/standards/sist/1074c0bf-3f0c-4e59-9a70-763a43fd13a9/iec-60794-1-308-2023)

<https://standards.iteh.ai/catalog/standards/sist/1074c0bf-3f0c-4e59-9a70-763a43fd13a9/iec-60794-1-308-2023>

## 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*

---

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[IEC 60794-1-308:2023](https://standards.iteh.ai/catalog/standards/sist/1074c0bf-3f0c-4e59-9a70-763a43fd13a9/iec-60794-1-308-2023)

<https://standards.iteh.ai/catalog/standards/sist/1074c0bf-3f0c-4e59-9a70-763a43fd13a9/iec-60794-1-308-2023>